



IMPERIAL AGRICULTURAL  
RESEARCH INSTITUTE, NEW DELHI.







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JOURNAL OF THE F.M.S. MUSEUMS.

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JOURNAL  
OF THE  
Federated Malay States Museums.

Vol. XVI  
December, 1930 to July, 1931.

PRINTED FOR THE F.M.S. MUSEUMS  
BY  
PRINTERS LIMITED,  
SINGAPORE.

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1931.



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Frontispiece, Herbert Christopher Robinson, (issued with  
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### CORRIGENDA.

- Page 14, Line 6, for Type : *Pleciobates tuberculatus* sp. nov.,  
read Type : *Pleciobates tuberculatus* sp. nov.
- Page 19, Footnote, for *Holovelgia* read *Halovelgia* ; for *Flerma-*  
*tobates* read *Hermatobates*.
- Page 22, Line 11, for *Vellida*, read *Veliida*.
- Page 56, Line 4, for *Trachy kedahæ* sp. n., read *Trachys*  
*kedahæ* sp. n.
- Page 63, Line 16 from foot of page, for *Neotoxcelus ornatus*  
sp. n., read *Neotoxoscelus ornatus* sp. n.
- Page 65, Line, 21, for *Melibæus melanescens* sp. n., read  
*Meliboeus melanescens* sp. n.
- Page 82, Line 25, insert sp. n. alter *Agrilus cyanochloris*.
- Page 98, Line 7 from foot of page, for *Roscarta punctata* sp. n.,  
read *Eoscarta punctata* sp. n.
- Page 107, Line 8, for *Simediria*, read *Simeliria*.
- Page 108, Line 7, for *H. sumatrensis* Schmidt., read *H. viridicans*  
Stal
- Page 108, Line 8, for *Modighanella sumatrensis* Schmidt, read  
*Modighanella sumatrana* Schmidt.
- Page 108, Line 7, from foot of page, for *P. suppressa* Wlk., read  
*P. expressa* Wlk.
- Page 109, Line 11, after *P. marginalis* add Schmidt. Line 3  
from foot of page, for *C. immaculata* Schm., read  
*C. unimaculata* Schmidt.
- Page 110, Line 4 from foot of page, read Genus *Notoscarta*  
Bredd.
- Page 111, Line 16, for 600-7,000 ft. read 6,000-7,000 ft.
- Page 112, Line 7, and page 117, Line 21, for Khao Kas read  
Khao Kao.
- Page 113, Line 3 from foot of page, for *C. circumdata* Wlk.,  
read *C. circumducta* Wlk.
- Page 115, Line 17, for *O. bipunctatus* Lall., read *O. tripunctatus*  
Lall. sp. n.
- Page 130, Line 30, for (p. ) read (p. 143).
- Page 156, Line 15 from foot of page, delete 1930.
- Page 285, Line 10, insert " to " before " be ".
- Page 359, Under caption 8, for *gedchanus* de Meijere, read  
*gedehensis* de Meijere.
- Page 378, Lines 18 and 20, for *Ochthepetina* read *Ochthopetina*.
- Page 396, Lines 15, 16 ; Page 397, Lines 13, 33, for *fastuosum*,  
read *fastosum*.
- Page 412, Line 13, for Kayabau read Kahayau.
- Page 422, Line 8, for Scys read Selys.
- Page 433, Line 12 from foot of page, for *Dicalus* read *Distichus*.
- Page 436, Line 8 from foot of page, for though read thought.
- Page 444, Lines 5 and 6, for *Synechostiotus* read *Synechostictus*.
- Page headings pp. 177-429, for 1930 read 1931.

## Herbert Christopher Robinson.

1874—1929.

Herbert Christopher Robinson, who resigned the appointment of Director of Museums, Federated Malay States, in 1926 to retire to England on pension, was born in Liverpool in November 1874 and died at Oxford after a long illness in May 1929. He was educated at Marlborough and obtained a scholarship at the Royal School of Mines, but lung-trouble caused him to give up his studies and he spent a couple of years at Davos where he acquired that love for the mountains and flowers of Switzerland which remained with him all his life: a part of each furlough was always spent in the Bernese Alps.

On his return to England he entered New College, where his uncle Mr. Alfred Robinson was for many years Fellow and Bursar. The full period of residence at the University was not part of his scheme of life and in 1896 he set out on a zoological journey to Queensland with the idea of ultimately visiting New Guinea; but after making a collection of birds in the neighbourhood of Cooktown repeated attacks of dysentery compelled him to put an end to his travels. Again in England, he became a demonstrator in Liverpool University and an assistant in the Liverpool Museums where between 1897 and 1900 he published with Dr. H. O. Forbes a series of catalogues of the collections of birds, the greater part of which had been presented to the city by the thirteenth Earl of Derby.

In 1901 and 1902 Robinson and the late Dr. Nelson Annandale, who eventually became Director of the Zoological Survey of India, carried out together an anthropological and zoological expedition to the Malay Peninsula under the auspices of the University of Edinburgh and the University of Liverpool. The results appeared between 1903 and 1907 in several volumes entitled "*Fasciculi Malayenses*" but the series was unfortunately never completed, probably because more immediate work claimed the attention of both: Annandale becoming Deputy-Superintendent of the Indian Museum, Calcutta, in 1904 while Robinson had been appointed Curator of the Selangor Museum in 1903. Robinson survived his one-time colleague by five years: by the early death of both these brilliant men biological science of the Oriental Region suffered a great loss. Annandale's published output was the greater—he seems to have had no interest except work: Robinson's outlook was wider and more "human": he perhaps possessed the power of perseverance to a less degree; as he said of himself, like the Athenians of old he was always seeking after some new thing. Thus undertakings that he commenced sometimes



remained unfinished: and much of his time was occupied with Fisheries, Exhibition and Meteorological work: work that in no way added to his reputation in the profession he had chosen.

In 1906 Robinson was made Inspector of Fisheries, in addition to his other duties; a new appointment in which he was called upon to organise a new department. In 1908 he succeeded Mr. Leonard Wray as Director of Museums, Federated Malay States, having under his charge the Perak and Selangor Museums. In 1914 his official title was changed to that of Director of Museums and Fisheries, Federated Malay States, and remained thus until 1921 when the fisheries of the Malay States and those of the Straits Settlements were formed into a separate department and placed in charge of a cadet officer. Previous to this, however, Robinson had been detailed to investigate the suitability of mountain sites in the Malay States for hill stations and during his furlough in 1920 he perfected his knowledge of meteorological work and selected and trained a party of observers. In 1921 he organised an observation station on Mount Tahan, the summit of which he had, in 1905, been the first European to reach, and after eighteen months of work there transferred the station to Cameron's Highlands on the Perak-Pahang Boundary which was finally selected for the Malayan Sanatorium.

In 1922 Robinson was in charge of the Arts and Crafts section of the Malayo-Bornean Exhibition at Singapore and he was later detailed to organise in the Peninsula, and afterwards to superintend at Wembley the Arts and Crafts section of the Malaya Pavilion at the British Empire Exhibition. He returned for a few months to Kuala Lumpur after the closing of the Exhibition and retired on pension in February 1926, receiving the thanks of Government for his services.

Robinson had long planned to produce a set of volumes on the Terrestrial Vertebrate Fauna of the Malay Peninsula analagous to those of the "Fauna of British India" and in 1912 there was published under his editorship a work on the Reptilia and Batrachia by Dr. G. E. Boulenger. It was his intention to prepare the other volumes in collaboration with the writer of this notice but the war, the demands made by their current work on the time of both and the various duties Robinson undertook for Government outside those of his appointment made this impossible; and the task was deferred until his retirement when it was still further postponed by the request of Government that he should first produce the less purely scientific work "The Birds of the Malay Peninsula" on which he was engaged until he succumbed to his final illness and of which he completed two of the five volumes projected. Shortly before he

became incapacitated he was elected co-editor of "Ibis." Under his editorship were issued some eleven volumes of the "Journal of the Federated Malay States Museums" which contains many of the papers written by him.

Robinson was a man of unusual ability and versatility: there were few subjects he could not master in a short time. Though later he specialised in the mammals and birds of Malaysia he was possessed of wide knowledge of, and competence in anthropology, zoology and botany.

Besides his early visit to Australia and his many journeys in the Malay States, Robinson visited for purposes of biological investigation the Siamese portion of the Malay Peninsula, the Rhio-Lingga Islands, Sumatra and Java. He had travelled in India and during the war was on service in Singapore and Mesopotamia. When on furlough he always paid long visit to Switzerland for mountains had a great attraction for him, though he was never in the climbing sense an Alpinist; but in the East what he perhaps enjoyed most was cruising on inspection in his Fisheries launch.

Robinson was a man of outstanding personality but of somewhat retiring disposition, by no means "hail fellow well met" with everybody and in manner often brusque: but those who knew him well can, like the writer who shared a house with him for fifteen years, bear witness to his ability, generosity and large-heartedness.

C. B. K.

The following is a list of Mr. H. C. Robinson's published work.

### GENERAL.

Itinerary in Perak, Selangor and the Siamese Malay States. *Fasciculi Malayenses*, Supplement, 1903, pp. i-xliv, 4 plates and map. (*In collaboration with N. Annandale*).

List of a small collection of Mammals. Birds and Batrachians from Gunong Angsi, Negri Sembilan. *Journ. F.M.S. Mus.*, i, 1905, pp. 25-30.

Notes on the occurrence in Selangor of three Vetebrates new to the Malay Peninsula. *Journ. Straits Branch, Roy. Asiatic Soc.*, xliv, 1901, pp. 222-225.

Report on the Gunong Tahan Expedition, 1905. *Journ. F.M.S. Mus.*, iii, 1908, pp. ix-xxv, pls. A & B.

List of a small collection of Mammals and Birds from the Mountains of Ulu Langat. Selangor. *Journ. F.M.S. Mus.*, iv, 1911, pp. 235-241.

Report on his visit to the Cocos Islands. Straits Settlements, No. 37 of 1912, pp. 1-8.

List of a small collection of Mammals and Birds from Gunong Kerbau, Perak. *Journ. F.M.S. Mus.*, v, 1914, pp. 23-27.

On a further collection of Mammals and Birds from the Hills of Negri Sembilan. *Journ. F.M.S. Mus.*, v, 1914, pp. 51-57. (*In collaboration with C. Boden Kloss*).

List of a small collection of Mammals and Birds from the Krau River, Pahang. *Journ. F.M.S. Mus.*, v, 1915, pp. 169-175. (*With C.B.K.*).

The Vertebrate collections of the Federated Malay States Museums. *Journ. F.M.S. Mus.*, vi, 1915, pp. 63-67.

Preliminary Diagnoses of some New Species and Sub-species of Mammals and Birds obtained in Korinchi, West Sumatra, February-June, 1914. *Journ. Straits Branch, Roy. Asiatic Soc.*, lxxiii, 1916, pp. 269-278. (*With C. B. K.*)

A collection of Mammals and Birds from Pulau Panjang, or Pulau Mapor, Rhio-Lingga Archipelago. *Journ. F.M.S. Mus.*, vii, 1916, pp. 59-72.

The Natural History of Kedah Peak, Malay Peninsula. I, Introduction; II, Mammals; III, Birds; IV, Reptiles and Batrachians. *Journ. F.M.S. Mus.*, vi, 1916, pp. 219-244. (*With C. B. K.*)

Prefaratory Note to the Botany of Korinchi, Sumatra. *Journ. F.M.S. Mus.*, viii, Pt. iv, 1917, pp. 1-8. pls. i-iv. (*With C.B.K.*).

Notes on the Vertebrate Fauna of the Pahang-Johore Archipelago. *Journ. F.M.S. Mus.*, vii, 1919, pp. 325-329, pls. vi-vii.

Mammals and Birds from the Hills of Nakon Sri Tamarat, Peninsular Siam. *Journ. F.M.S. Mus.*, xi, 1923, pp. 58-63. (*With C. B. K.*).

Vertebrates of the Malay States. *Malaya*, pp. 47-70 (Constable & Co., 1923.).

Museums of the Federated Malay States: *An illustrated Guide to the Federated Malay States*, pp. 266-292. (The Malay States Information Agency, 1923).

Preliminary Report on the Meteorological Observations taken on Gunong Tahan, July, 1921-June, 1923. Federated Malay States. No. 29 of 1923.

Annual Official Reports on the Museums Department, F. M. S.; Fisheries Department, F.M.S.; Meteorology of the F.M.S.

**Anthropology and Ethnography.**

Anthropological Notes on Saikau, a Siamo-Malayan Village in the State of Nawngchik (Tojan). *Man*, 1902, pp. 118-120. (*In collaboration with N. Annandale.*)

Some preliminary results of an expedition to the Malay Peninsula. *Journ. Anthropol. Inst.*, xxiii, 1902, pp. 407-417, pl. xl, text-fig. 1. (*In collaboration with N. Annandale.*)

Contributions to the Ethnography of the Malay Peninsula. Part 1: Semang and Sakai Tribes. *Fasciculi Malayenses*, Anthropology, i, 1903, pp. 1-51, pls. i-xiii, text-figs. 1-14. (*In collaboration with N. Annandale.*)

Contributions to the Ethnography of the Malay Peninsula. Part iii: Malays of Perak. *Fasciculi Malayenses*, Anthropology, i, 1903, pp. 67-72, pl. xv, text-fig. 15. (*In collaboration with N. Annandale.*)

Contributions to the Physical Anthropology of the Malay Peninsula. Section 1: Observations on the Living Person (Semang, Sakai, Coast Folk of Trang, Perak Malays) *Fasciculi Malayenses*, Anthropology, i, 1903, pp. 105-149. (*In collaboration with N. Annandale.*)

Contributions to the Physical Anthropology of the Malay Peninsula. Section ii, part 1: Observations on the Skeleton; Semang and Sakai Tribes. *Fasciculi Malayenses*, Anthropology i, 1903, pp. 150-166; pls. xvi-xviii. (*In collaboration with N. Annandale.*)

Additional Notes on the Semang Paya of Ijok, Selama, Perak. *Journ. F.M.S. Mus.*, v, 1915, pp. 187-191, pls. xvi-xxv. (*In collaboration with C. Boden Kloss.*)

Some Semang Vocabularies obtained in Pahang and Perak, ii-vi. *Journ. F.M.S. Mus.*, vi, 1915, pp. 115-125. (*With C. B. K.*)

**Mammals.**

A rare Squirrel from Kuala Lumpur, Selangor, *Journ. F.M.S. Mus.*, i, 1905, p. 60.

On a Squirrel new to the fauna of the Malay Peninsula. *Journ. F.M.S. Mus.*, i, 1905, pp. 65-66.

On mammals from the Rhio Archipelago and Malay Peninsula collected by Messrs. H. C. Robinson, C. Boden Kloss and E. Seimund. By Oldfield Thomas and R. C. Wroughton. With Notes by H. C. Robinson and C. Boden Kloss, *Journ. F.M.S. Mus.*, iv, 1909, pp. 99-129.

Notes on Indo-Malayan Squirrels with descriptions of two new races. *Journ. F.M.S. Mus.*, iv, 1911, pp. 166-168. (*In collaboration with R. C. Wroughton.*)

On six new Mammals from the Malay Peninsula and adjacent islands. *Journ. F.M.S. Mus.*, iv, 1911, pp. 169-174. (*In collaboration with C. Boden Kloss.*)

On five new subspecies of Oriental Squirrels. *Journ. F.M.S. Mus.*, iv, 1911, pp. 233-235. (In collaboration with R. C. Wroughton).

On new Mammals from the Malay Peninsula and adjacent islands. *Journ. F.M.S. Mus.*, iv, 1911, pp. 241-246. (With C. B. K.)

On new Mammals from the Islands of the Johore Archipelago, South China Sea. *Ann. and Mag. N. H.* (8) x, 1912, pp. 589-595.

Zoological Results of the Abor Expedition: Mammals. *Rec. Indian Mus.*, viii, 1913, pp. 85-98.

On new Mammals mainly from Bandon and the adjacent islands, East Coast of the Malay Peninsula. *Ann. and Mag. N.H.* (8) xiii, 1914, pp. 223-234. (With C.B.K.)

Some Remarks on Dr. G. D. Elliot's 'Review of the Primates.' *Ann. and Mag. N. H.* (8) xiii, 1914, pp. 389-399. (With C. B. K.)

*Aeromys*, a new genus of Flying-Squirrel *Journ. F.M.S. Mus.*, vi. 1915, p. 23. (With C.B.K.)

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The Zoology of Koh Samui and Koh Pennan, Islands of Peninsular Siam. II, Mammals. *Journ. F.M.S. Mus.*, v, 1915, pp. 130-139. (With C.B.K.)

A note on the Variation of a local race of Rat from Pulau Jarak, Straits of Malacca. *Journ. F.M.S. Mus.*, vii, 1916, pp. 7-18.

On an aberration of *Sciurus prevosti prevosti* from Southwestern Pahang (S. p.p. ab. *meticulosus*, ab. loc. nov. *Journ. F.M.S. Mus.*, vii, 1916, pp. 19-21.

A note on *Callosciurus finlaysoni* (Horsf.) and allied forms with the description of a new form. *Journ. F.M.S. Mus.*, vii, 1916, pp. 35-36.

On a new race of *Callosciurus vittatus* (Raffles) from Singapore Island. *Journ. F.M.S. Mus.*, vii, 1916, pp. 73-74.

On a new race of *Callosciurus atrodorsalis* (Gray) from North Siam. *Journ. F.M.S. Mus.*, vii, 1916, p. 91. (In collaboration with R. C. Wroughton.)

On two new subspecies of Squirrel from Southern India. *Rec. Indian Mus.*, xiii, 1917, pp. 41-42.

On two little-known Rats from Western Java. *Journ. F.M.S. Mus.*, vii, 1917, pp. 93-99.

On three new races of Malayan Mammals. *Journ. F.M.S. Mus.*, vii, 1917, pp. 101-105.

A new Mink-like *Mustela* from Java. *Ann. and Mag. N.H.* (8) xx, 1917, pp. 261-262. (In collaboration with Oldfield Thomas).

A new race of Hare from the Persian Frontier of Mesopotamia. *Rec. Indian Mus.*, xv, 1918, pp. 49—50.

A nominal list of the Sciuridae of the Oriental Region with a list of the specimens in the collection of the Zoological Survey of India. *Rec. Indian Mus.*, xv, 1918, pp. 171—254. (With C.B.K.).

Notes on the genus *Petaurista*, Pall., with descriptions of two new races. *Journ. F.M.S. Mus.*, vii, 1918, pp. 223—226. (With C.B.K.).

Mammals of Korinchi, Sumatra. *Journ. F.M.S. Mus.*, viii. Pt. II, 1918, pp. 1—72, pls. i—iii. (With C.B.K.).

A List of the Mammals of Sumatra. *Journ. F.M.S. Mus.*, viii, Pt. II, 1918, pp. 73—80. (With C.B.K.).

On five new Mammals from Java. *Ann. and Mag. N. H.* (9) iv, 1919, pp. 374—378. (With C.B.K.).

On a collection of Mammals from the Bencoolen and Palembang Residencies, Southwest Sumatra. *Journ. F.M.S. Mus.*, vii, 1919, pp. 257—291, pl. v. fig. 1. (With C.B.K.).

On Mammals, chiefly from the Ophir District, West Sumatra. *Journ. F.M.S. Mus.*, vii, 1919, pp. 299—323. (With C.B.K.).

Notes on Viverridae. *Rec. Indian Mus.*, xix, 1920, pp. 175—179. (With C.B.K.).

Some new insular Squirrels of the *Callosciurus caniceps* Group from Peninsular Siam. *Ann. and Mag. N. H.* (9) vii, 1921, pp. 118—123. (In collaboration with Oldfield Thomas).

Two new Indo-Malayan Rats. *Ann. and Mag. N. H.* (9) vii, 1921, pp. 234—236.

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The Bearded Pig (*Sus barbatus*) in the Malay Peninsula. *Journ. Straits Branch, Roy. Asiatic Soc.*, lxxxv, 1922, pp. 202—205. (In collaboration with J. C. Moulton).

Mammals of Korinchi and of Sumatra: Addenda and Corrigenda. *Journ. F.M.S. Mus.*, viii, Pt. II, 1928, pp. 312—319. (With C.B.K.).

A new Rat from the Mountains of East Java. *Journ. F.M.S. Mus.*, xiii, 1927, p. 209. (With C.B.K.).

#### Birds.

Catalogue of the Parrots (*Psittaci*) in the Derby Museum. *Bull. Liverpool Museums*, i, 1897, pp. 5—22, pls. i—ii. (In collaboration with H. O. Forbes).

Notes on two species of Pigeon. *Bull. Liverpool Museums*, i, 1898, pp. 35—36. (In collaboration with H. O. Forbes).

Catalogue of the Cuckoos and Plantain-eaters (Cuculi) in the Derby Museum. *Bull. Liverpool Museums*, i, 1898, pp. 37-48. (In collaboration with H. O. Forbes).

Catalogue of Picarian Birds (Bucconidae, Galbulidae, Capitonidae, Rhamphastidae, Indicatoridae, Picidae) in the Derby Museum. *Bull. Liverpool Museums*, i, 1898, pp. 87-118. (In collaboration with H. O. Forbes).

Catalogue of the Coraciæ (Leptosomatidae, Coraciidae, Momotidae, Alcedinidae, Meropidae) and of the Trogons (Trogonidae) in the Derby Museum. *Bull. Liverpool Museums*, ii, 1899, pp. 15-34. (In collaboration with H. O. Forbes).

Notes on three rare and not hitherto figured species of Zosterops in the Derby Collection. *Bull. Liverpool Museums*, ii, 1899, p. 47, pl. i.

Catalogue of the Charadriomorphic Birds (Charadriiforms): Auks (Alcidae): Gulls (Laridae) and Skuas (Stercorariidae)—Lari; Lark-plovers (Thinocoridae), Stone-curlews (Oedienidae), Jacanas (Jacanidae), Sheathbills (Chionidae), Crab-plovers and Snipes (Charadriidae) Limicolæ; Pigeons (Columbæ), and Sandgrouse (Pterocletes) in the Derby Museum. *Bull. Liverpool Museums*, ii, 1899, pp. 51-75; 1900, pp. 117-150, pls. ii and iii. (In collaboration with H. O. Forbes).

Contributions to the Zoology of North Queensland. *Bull. Liverpool Museums*, ii, 1900, pp. 115-116.

The Birds of North Queensland. Part 1. On two collections from Cooktown and the neighbourhood of Cairns. *Ibis*, 1900, pp. 617-653. (In collaboration with W. S. Laverock).

On a new species of Turnix from North Queensland. *Bull. B.O.C.*, x, 1900, p. xliii.

On a new species of Tree-Partridge from the mountains of the Malay Peninsula. *Ibis*, 1905, pp. 165-169, pl. iv.

A Synopsis of the Birds at present known to inhabit the Malay Peninsula south of the Isthmus of Kra. *Journ. F.M.S. Mus.*, i, 1905, pp. 45-57 (the Pigeons); 1906, pp. 124-132 (the Gallinaceous Birds).

A Visit to the Aroa Islands (Straits of Malacca) with a list of Birds found there. *Journ. F.M.S. Mus.*, ii, 1906, pp. 8-16.

On a specimen of *Idiopsar brachyurus* from La Paz, Bolivia, in the Liverpool Museum. *Ibis*, 1906, pp. 387-388.

A Handlist of the Birds of the Malay Peninsula south of the Isthmus of Kra. *Journ. F.M.S. Mus.*, ii, 1907, pp. 66-83.

A Handlist of the Birds of the Malay Peninsula south of the Isthmus of Kra. New and revised edition. Kuala Lumpur, Government Printing Office, 1910.

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The Birds at present known from the Mountains of the Malay Peninsula. *Journ. F.M.S. Mus.*, ii, 1909, pp. 164-222.

Notes on Birds new to, or rare in, the Malay Peninsula. *Journ. F.M.S. Mus.*, iv, 1909, pp. 129-133; v, 1913, pp. 15-22.

Two new species of Birds from the Malay Peninsula. *Bull. B.O.C.*, xxv, 1910, pp. 98-100.

Remarks on six rare species of Birds from the Malay Peninsula. *Bull. B.O.C.*, xxv, 1910, pp. 110-111.

On Birds from the Northern Portion of the Malay Peninsula, including the Islands of Langkawi and Terutau; with Notes on other rare Malayan species from the Southern Districts. *Ibis*, 1910, pp. 659-675, pl. x and text-fig. 6; 1911, pp. 10-80, pl. 1 and text-figs. 5 and 6. (*In collaboration with C. Boden Kloss*).

On a new Horned Owl from the Malay Peninsula. *Journ. F.M.S. Mus.*, iv, 1911, pp. 246-247.

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## II. NEW OR LITTLE-KNOWN GERRIDAE FROM THE MALAY PENINSULA

By TEISO ESAKI

(With four text-figures.)

The material on which the present paper is based was collected by Messrs. C. Dover and E. Seimund in the Malay Peninsula in 1926 and belongs to the Federated Malay States Museums.

### Genus *Pleciobates* gen. nov.

*Apterous form.* ♀. Body oblong, fusiform. Head much longer than broad between eyes, anteocular portion not longer than the rest of head. Eyes much rounded laterally, slightly emarginate interiorly. Antennae very long and slender, not longer than body, first segment longer than the rest of the antennae, second and fourth segments subequal in length, third one-third the length of first, a little longer than the second. Rostrum not passing the anterior coxae, third segment much the longest, a little swollen at the middle. Pronotum transverse, anterior and posterior margins nearly straight. Mesonotum very large, three times as long as pronotum, lateral margins not quite parallel. Metanotum much shorter than mesonotum, a little longer than pronotum, lateral portions more or less confluent with mesothorax, separated into two portions antero-posteriorly, posterior portion much shorter than the anterior portion. Anterior legs slender, femur stoutest, slightly tapering towards the apex, tibia more slender and shorter than femur with an acute process at the inner side of apex, tarsus much longer than half the length of tibia, first segment one and a half times as long as second. Intermediate and posterior legs very long and slender: intermediate femur much longer than body, tibia more slender than femur, a little longer than a half of the latter; tarsus about one half of tibia, much thinner than tibia, tapering towards the apex, first segment about six times as long as second: posterior femur slightly shorter and much thinner than intermediate femur, tibia about a half of femur tapering towards the apex, tarsus very short, not longer than one-tenth of tibia, first segment about twice the length of the second. Intermediate and posterior acetabula lateral to the abdomen. Abdomen broad and short, about as long as mesonotum. Dorsal segments very broad, first four segments subequal in length, fifth longer than the two preceding segments together, sixth shorter than the fifth. Ventral segments ring-shaped, first five segments equal in breadth, the sixth much narrower, more or less tube-like. Female genital segments very small, slightly protruding the end

of abdominal segment. Connexivum broad, almost perpendicularly erected, ending into a very long, stout spine-like process, which is much projecting beyond the end of abdominal segment.

♂ and the macropterous form are unknown.

Type: *Pleciobates tuberculatus* sp. nov.

This genus undoubtedly belongs to the subfamily *Ptilomerinae*. It differs from the other genera of the subfamily in the shorter head, very remarkable structure of the connexivum, and in some other less important characters. The females of *Ptilomera*, Amyot et Serville have an apparently similar structure of the connexivum to that in this genus, but in the former the apical prolongation is rather filament-like, whereas in the latter the same is stout and spine-like. As a matter of fact this genus is more closely allied to *Rhyacobates* Esaki, than to *Ptilomera* Amyot et Serville.

*Pleciobates tuberculatus* sp. nov. (Fig. 1.)

*Apterous female.* Body black with brown markings, and grayish pubescence. Head dark brown, a large middle spot on the anterior part of vertex, basal margin of head, antenniferous tubercles, extreme apex of frons black, with minute brown pubescence. Eyes black, shining. Antennae totally black. Rostrum very pilose, dark brown with the apical half of the third and the entire fourth segment black. Dorsal surface of thorax pitchy black, more or less shining, a conspicuous longitudi-

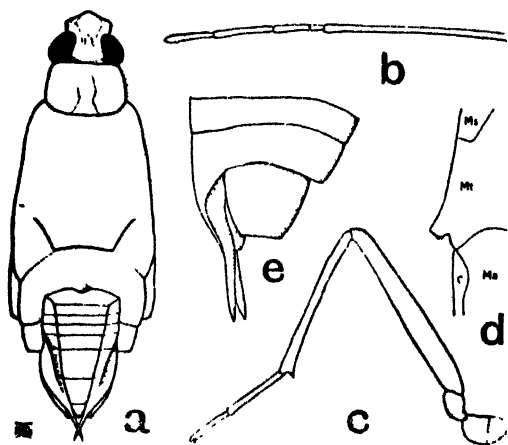


Fig. 1. *Pleciobates tuberculatus*. Esaki.

- a. female.
  - b. antenna.
  - c. anterior leg.
  - d. metanotal process, from the right side.
  - e. end of abdomen, from the right side.
- C=Connexivum, Ma=Metacetabulum,  
Me=Mesonotum, Mt=Metanotum.

nal brown marking in the middle of pronotum; lateral sides, suture between meso- and metanotum and a small area on each side of the median longitudinal line of mesonotum with silvery, grayish pubescence. Prosternum pale brown with the same coloured pubescence, with a very small black spot at the end of the acetabular suture. Mesosternum black, except the posterior area and acetabulum which are pale brown, with

very dense grayish pubescence. Metasternum (apparently the first ventral abdominal segment) pale brown, thickly pubescent. Anterior coxa, trochanter and femur brown, extreme base and apex of femur, three conspicuous stripes on the femur, tibia and tarsus black. Intermediate and posterior legs black with the coxae, trochanters and the base of the intermediate femur brown. Dorsal surface of abdomen pitchy black, coarsely covered with grayish pubescence, apex of the last genital segment brown. Connexivum pitchy black with the apical prolonged portion pale brown. Ventral surface of abdomen pale brown, sixth segment much darker; thickly covered with silvery grayish pubescence.

Body fusiform, about three times as long as broad. Antennae a little shorter than body, first segment longer than the rest of the antennae, ratio of the antennal segments: 18: 5: 6: 5, the last segment slightly flattened near the apex. Pronotum transverse, anterior and posterior margins straight; mesonotum very large, moderately convex, a little widened posteriorly; metanotum about one half of the mesonotum in length, lateral portions much protruded anteriorly, divided into two portions by a distinct transverse ridge, the anterior portion about five times as long as the posterior one, with a conspicuous tubercle-like process in the middle of the ridge (well observable in profile). The characters of the legs are given in the generic description. Abdomen broad and short, about as long as mesonotum, narrowed posteriorly; first four segments nearly equal in length, fifth slightly shorter than the preceding three segments taken together, sixth a little shorter than the fifth. Connexivum broad, almost perpendicularly erect, forming a very conspicuous, long, stout spine-like process at the end, which is almost as long as the last two dorsal abdominal segments taken together, directed inwardly and crossed with each other at the apex. First four ventral abdominal segments very short, increasing the length from first to fourth; fifth much longer than the fourth, nearly as long as the third and fourth taken together; sixth very long, nearly as long as three preceding segments taken together, much rounded and narrowed posteriorly. Genital segments very small, mostly inserted in the sixth segment.

Length of body 7 mm., breadth of body 2.3 mm., length of intermediate femur 9.5 mm., length of intermediate tibia 5.5 mm., length of posterior femur 8.5 mm., length of posterior tibia 3.5 mm.

Male and the macropterous form are unknown.

Habitat: Malay Peninsula.

Holotype, female, Klang River near Klang Gates, August, 21st 1926, (C. Dover), (Federated Malay States Museums.)

**Rhagadotarsus kraepelini** Breddin. (Fig. 2.)

*Rhagadotarsus kraepelini* Breddin, Mitt. Naturhist. Mus. Hamburg, XXII, p. 137 (1905). Bergroth, Philipp. Journ. Sci., 5D, XIII, p. 122 (1918). Esaki, Trans. Nat. Hist. Soc. Formosa, XXII, p. 55 (1922); Philipp. Journ. Sci., XXVI, p. 60, pl. i, figs. 13-17 (1925); Ann. Mus. Nation. Hungar., XXIV, p. 182 (1926).

*Nucebus dux*. Distant, Ann. Mag. Nat. Hist., (8) V, p. 153 (1910); Faun. Brit. Ind., Rhynch., V, p. 166, fig. 90 (1910). Paiva, Rec. Ind. Mus., XIV, p. 26 (1918).

Macropterous form of this interesting species has not hitherto been recorded. A single male macropterous specimen is present in this collection and I herewith describe it as follows:

**Macropterous form.**—Pronotum strongly developed backwardly, slightly longer than broad (17: 15). Black

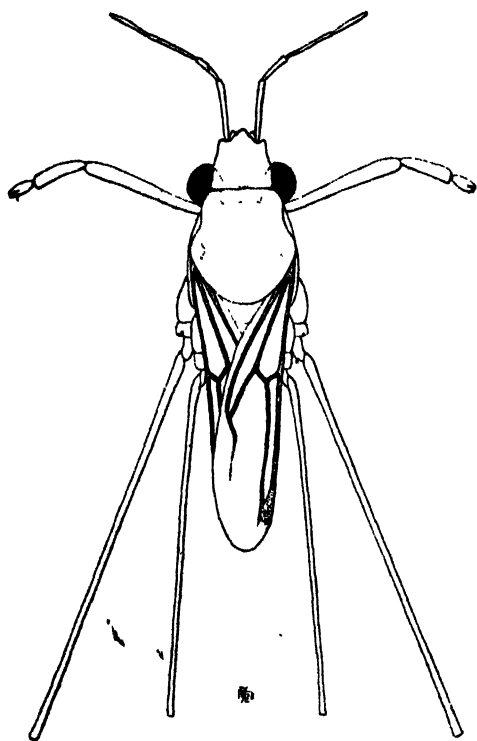


Fig. 2.

*Rhagadotarsus kraepelini* Breddin.  
Macropterous male, intermediate and posterior tibiae and tarsi not delineated.

with a conspicuous brown fascia in the middle of the anterior area (corresponding to the marking of the apterous form). Anterior margin perfectly straight, lateral margins concavely sinuate before the humeral angles, a little divergent posteriorly; humeral angles more or less distinct, postero-lateral margin much rounded, nearly forming a semi-circle; very slightly elevated along the median longitudinal line and the line across the humeral angles. Hemelytra very much developed, exactly reaching the apex of abdomen, very long and narrow, costal margin slightly concavely sinuate, veins very distinct as shown in the figure; dark brown with the basal area much whitish, with the veins blackish brown.

Length of body: ♂ 3.7 mm.

Morphotype, male; Singapore; pond next to Thomson Road Reservoir, November 15, 1926 (C. Dover),  
(Federated Malay States Museums).

***Halobates proavus* B. White.**

*Halobates proavus*. B. White, Report Voyage Challenger, Zool., vii, pt. 19, p. 54, pl. ii, fig. 1 (1883).

*Halobates rotundatus*. Esaki, Ann. Mus. Nation. Hungar., xxiii, p. 131, fig. 4 (1926).

Since I described a new *Halobates* from New Guinea under the name *Halobates rotundatus*, I have had the opportunity of examining the type, a male, of *Halobates proavus*, B. White in the British Museum, and I have come to the conclusion that both the species are identical. Here it must be pointed out that the description and figures by B. White are very inaccurate, and it is almost impossible to identify this species from them. The male of this species is never so oblong as shown in his figure (*loc. cit.*, pl. ii, fig. 1), the first anterior tarsal segment in male is much shorter than is shown in his figure (compare pl. ii, fig. 1, f. t. and my figure, *loc. cit.*, fig. 4, d), and the "horns" of the first ("second" of B. White) male genital segments are not symmetrical and only the left-handed one is partly visible from above. His figure of the male genital segments (pl. i, fig. 1g) is also inaccurate in other respects.

This species is well separated from the other species of the genus by the following characters:

Male much smaller than female, lateral margins of body more or less parallel in male, much rounded in female. First antennal segment subequal to or slightly shorter than the rest of antennae, second slightly shorter than half of first, third two-thirds of second, fourth shorter than second and longer than third. The ratio between the anterior tarsal segments more or less variable, but their first segment always much shorter than the second, in male the former about one-third to two-fifths of the latter, in female about one-third to one half of the latter. Female sometimes with a brown longitudinal median stripe on mesonotum, and a brown fascia along the posterior margin of first two or three dorsal abdominal segments. Male ventral genital segments asymmetrical as described and figured by me in the description of *Halobates rotundatus*, Esaki (*loc. cit.*, p. 132, fig. 4, *e.f.*)

This species was originally described from Gilolo (Halmaheira), and was also recorded from Dregerhafen, New Guinea. Here I add another new locality to the range of this species: 2 ♂♂, 2 ♀♀, Pulau Angsa, West Coast of Malay Peninsula, October 10-12th, 1926 (E. Seimund), (Federated Malay States Museums.)



**Ventidius aquarius Distant.**

*Ventidius aquarius*. Distant, Ann. Mag. Nat. Hist., (8), v, p. 150 (1910); Faun. Brit. Ind., Rhynch., v, p. 157, fig. 84 (1910.)

A cotype of this species, a single apterous male, from Pallode near Trivandrum, Travancore, is now to be found in the British Museum. Here I give a new record of this species: 1 ♀, Sungai Ampang, Selangor, Federated Malay States, August 15, 1926 (C. Dover), (Federated Malay States Museums). Length of body, ♂ (cotype) 3.5 mm.,\* ♀ 4 mm. Ratio of the antennal segments (cotype): 18: 9: 7: 7.

**Ventidius distantii Paiva.**

*Ventidius distantii*. Paiva, Rec. Ind. Mus., xiv, p. 25, pl. viii, fig. 4 (1918).

This species was described from the He-Ho River, Sawnheve State, Burma. Paiva's description is based mostly on colour characters. His "mesonotum" evidently includes a part of the metanotum, as he says: "mesonotum large, about as long as its greatest breadth." This species is readily distinguishable from the foregoing species in its smaller size, the blacker colouration, and the longer third antennal segment than the second. The last character was not cited by Paiva in his description, but is observable in his figure. In the present collection there is 1 ♂, Sungei Ampang, Selangor, Federated Malay States, September 5th, 1926 (C. Dover). In this specimen the black markings on the dorsal surface of body are more developed, and the pronotum is totally black. Length of body: ♂ 3 mm., ratio of the antennal segments: 14: 5: 8: 6.

**Halovelvia malaya sp. nov. (Fig. 3).**

*Female*.—Body above and beneath, eyes, antennae and legs entirely pitchy black, only the basal area of vertex is faintly brownish, thickly covered with thick grayish pubescence.

Body rather oblong, broadest at the base of mesonotum, strongly tapering backwardly. Head more or less convex, vertex broad, protruded anteriorly. Eyes small, but comparatively larger than in *Halovelvia maritima* Bergroth, agglomerate, shining. Antennae not shorter than half the length of body, first segment longest, curved outwardly, slightly thickened at the middle, second about three-fifths of the first, much less slender than the first, slightly thickened at the apex, third as long as the second, a little more slender, fourth a little longer than third, stout,

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\* Judging by this measurement of Distant's cotype, and the size indicated in his figure (about 3.8 mm.), his statement as to the length of the apterous form; "4.5" mm., seems rather inaccurate.

although I have not yet examined the type in the Indian Museum, Calcutta.

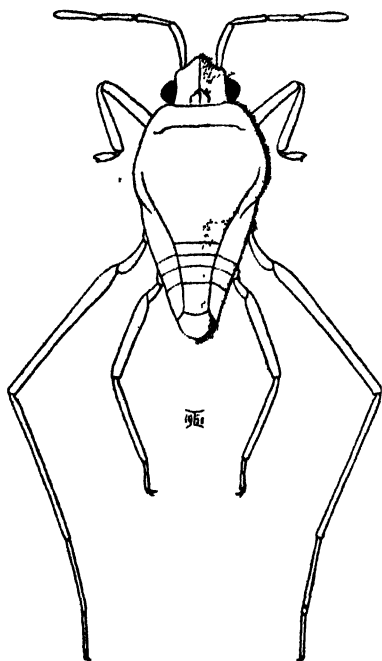


Fig. 3. *Halovelgia malaya* Esaki.  
Female.

clavi-form. Ratio of the antennal segments=25:17:17:21. Rostrum reaching the anterior coxae, third segment much the longest. Pronotum very short, shorter than half the length of head, much broader than head, anterior margin slightly concavely sinuate, posterior margin straight. Mesonotum about as long as broad, moderately convex; metanotum not well distinguishable from the mesonotum owing to the thick pubescence. Mesosternum very flat, posterior margin deeply concavely sinuate; posterior margin of metasternum almost straight. Anterior legs short; coxa very short, about

as long as broad; trochanter about one and a half times as long as broad, femur long, much thickened at the middle, tibia about four-fifths of femur, slightly tapering near the base, tarsus about two-fifths of tibia, first segment very small, second segment very stout, more or less flat, calviform, four times as long as first, claws inserted near the base. Intermediate legs very long, coxa very short and stout, shorter than broad, trochanter very long,\* about three times as long as coxa, femur very long, tibia, slightly shorter and more slender than femur, tarsus about three-fourths of tibia, second segment about three-fifths of the first, claws apical. Intermediate femur: tibia: tarsus I: II=20:18:8:5. Posterior legs much shorter than intermediate ones, coxa more slender and longer than intermediate one, trochanter as long as coxa, femur nearly half of intermediate one, slightly thickened at the middle, tibia a little shorter than femur, tarsus about half of tibia, first segment half of the second, claws subapical. Posterior femur: tibia: tarsus I: II=25:20:3:6. Abdomen much elongate, comparatively longer than in any other species of the genus, narrowed posteriorly, first five dorsal segments subequal in length, sixth very

\* The mesotrochanter in *Halovelgia* is always extraordinarily long, and may be regarded as a good generic character, though it is also well exhibited in *Flermatobates* Carpenter.

long, as long as fourth and fifth taken together, posterior margin much rounded. Genital segments conspicuous. Connexivum erect, bent upon the dorsal surface of abdomen.

Length of body ♀ 2.5 mm., breadth of body 1.1 mm.

Male is unknown.

Habitat: Malay Peninsula.

Holotype ♀, Paratype ♀, Pulau Angsa, West Coast of Malay Peninsula, October 10th, 1926 (E. Seimund), (Federated Malay States Museums.)

These specimens were collected at the same time as those of *Halobates proavus* B. White, mentioned above.

This species differs from the rest of the genus by the almost entirely black colouration of the body, and the more elongate abdomen. This is the first representative of the genus occurring on the continental coast.

Genus *Entomovelina* gen. nov.

*Apterous form:* Very small in size. Body much rounded, stout, fusiform, thickly covered with pubescence. Female more elongate than male. Head very large, shorter than broad between eyes at the base. Eyes very large, agglomerate, much rounded exteriorly, not protruded posteriorly, inner margin almost straight. Antennae much shorter than body, stout; first segment very stout, curved exteriorly, a little shorter than head; second about three-fourths of the first, much less stout; third the longest, about one and a half times as long as second; fourth a little longer than second, much thickened at the middle. Rostrum reaching the anterior coxae, third segment much the longest. Pronotum transverse, very short, anterior margin concavely sinuate, posterior margin straight. Mesonotum very large and broad, more than twice as broad as long, metanotum very short, suture between meso- and metanotum straight but very obscure owing to the thick pubescence. Pro-, meso- and metapleuron are very clearly separated by deep sutures. Propleuron confluent with pronotum, much shorter than pronotum; mesopleuron very broad and large, distinctly separated from mesonotum; metapleuron represented by a separated plate. Prosteronum very short, mesosternum very wide and long, metasternum very short. Anterior legs short; coxa very short, about as long as broad; trochanter about twice as long as broad; femur very stout, incrassate at the middle; tibia slightly shorter and much less stout than femur; tarsus less than a half of tibia, first segment very small and short, second more than three times as long as first, very broad, claviform, claws subapical. Intermediate legs very long; coxa very short, not longer than broad, trochanter long, but not so long as in *Halovelina*; femur very long and stout, tapering towards the apex, especially in male; tibia subequal but much more slender than femur; tarsus about two-thirds of and more slender than tibia, first

segment more than one and a half times as long as second. Posterior legs much shorter than intermediate pair; coxa and trochanter very short; femur long, very stout in male, less so in female; tibia slightly longer and more slender than femur; tarsus very short, first segment about half of the second, claws subapical. Abdomen very broad, narrowed posteriorly, connexivum broad, more erect in female than in male.

Macropterous form is unknown.

Type: *Entomovelina doveri* sp. nov.

This genus is most closely allied to *Strongylovelina* Esaki, from which it is distinguished by the following characters:

1. Sutures between pleural and sternal sclerites are very pronounced.
2. Second antennal segment of the antennae shorter than the first.
3. First posterior tarsal segment much shorter than the second.

*Entomovelina doveri* sp. nov. (Fig. 4.)

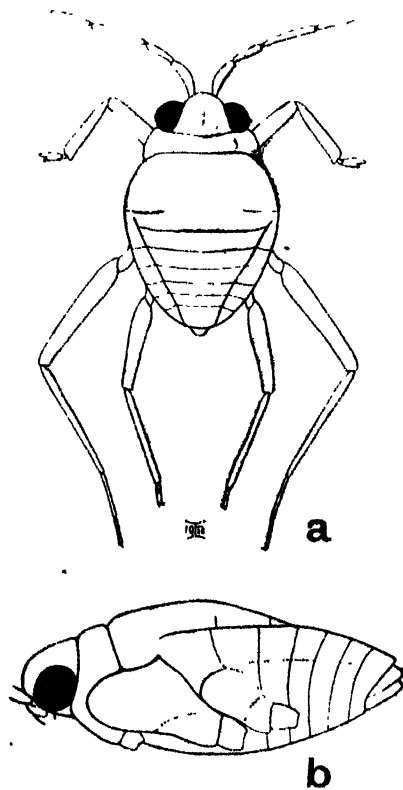


Fig. 4.

*Entomovelina doveri*. Esaki.

a. Male.

b. Male in profile, semi-diagrammatic.

*Apterous form* ♂ ♀

Body black, covered with thick brown pubescence. Head black with the basal area brown, eyes black, shining, antennae and rostrum black, but more or less brownish. Pronotum black, the central area except the posterior margin brown, with long pale brown pubescence. The rest of the body above and beneath entirely black. Legs blackish brown: all the coxae, trochanters, anterior femur except the apex, and basal one-third or a yellowish brown. half of posterior femur

Structural characters are given in the generic description. Ratio of the antennal segments=4: 3: 5: 4. Anterior leg—femur:tibia:tarsus I: 11=35: 30: 3: 12. Intermediate leg—65: 60: 27: 16. posterior leg—40: 45: 4: 10.

Length of body ♂ 1.5 mm., ♀ 1.7 mm., breadth of body ♂ 0.9 mm., ♀ 1.0 mm

Macropterous form is unknown.

Habitat: Malay Peninsula.

Holotype ♂, allotype ♀, hill stream in Gombak Valley, 1,560 feet, Selangor, Federated Malay States, September 11th, 1926 (C. Dover), (Federated Malay States Museums.)

The Gerrid genera *Halovelina* Bergroth, *Strongylovelina* Esaki, *Entomovelina* Esaki, and *Xenobates* Esaki, are closely allied to one another but are well separated from the rest of the family. They present some resemblances to the *Vellidae*. They may be separated as a natural group *Haloveliinae* subf. nov. as follows.

#### Subfamily Haloveliinae subfam. nov.

Very small in size, stout in shape, covered with thick pubescence. Normally apterous, very rarely macropterous. Head with eyes broader than long, moderately convex, protruded anteriorly. Eyes agglomerate, rounded, shining, protruded laterally. Antennae shorter than body, first segment stout, slightly curved outwardly, fourth always thickened. Rostrum reaching the anterior coxae. Pronotum very short in apterous form, mesonotum broad, more or less convex, metanotum apparently not well distinguishable from mesonotum. Anterior legs short, femur stout, tibia shorter and more slender than femur, tarsus very short, first segment very short and small, second always very thickened and rather flat, claviform, claws subapical. Intermediate legs much the longest, femur stouter near the base, tibia more slender and a little shorter than femur, tarsus always longer than half of tibia, first segment much longer than second, claws apical. Posterior legs much shorter than intermediate pair, much stouter in male than in female, tibia not much longer or shorter than femur, tarsus very short, first segment always not longer than the second. Abdomen very short, broader in female than in male, genital segments rather small.

Type genus:—*Halovelina* Bergroth.

Distribution:—South-Eastern Asia, Malaysian and Papuan Islands and Australia. (Only one marine species is known from Zanzibar, E. Africa).

#### KEY TO GENERA.

1. (4) First segment of antennae longer than third, eyes small, not broader than half the breadth between eyes.....2.
2. (3) Intermediate femur adorned with a row of very long stout setae on the outer margin, male genital segments conspicuous, brown in colour, smaller than 1.5 mm. On flowing water.....*Xenobates* Esaki,

3. (2) Intermediate femur without conspicuous setae, male genital segments very small, black in colour, always larger than 1.5 mm. Dwelling on sea-water near shore, on corals.....*Halovelis* Bergroth.
4. (1) First segment of antennae shorter than third, eyes enormously large, broader than half the breadth between eyes.....5.
5. (6) Second segment of antennae longer than first, first posterior tarsal segment subequal to second .....*Strongylovelis* Esaki.
6. (5) Second segment of antennae shorter than first, first posterior tarsal segment about one half of second .....*Entomovelis* Esaki.

[I] *Xenobates* Esaki, 1927.

*Microbates* Esaki, Ann. Mus. Nation. Hungar., xxiii, p. 153 (1926), *nom. praeocc.*

*Xenobates* Esaki, Entomologist, lx, p. 184 (1927), *nom. nov.*

Type:—*Xenobates seminulum*, (Esaki).

One species.

1. *Xenobates seminulum* (Esaki).

*Microbates seminulum* Esaki, Ann. Mus. Nation. Hungar., xxiii, p. 154, fig. 10 (1926).

Habitat:—New Guinea.

[II] *Strongylovelis* Esaki, 1924.

*Strongylovelis* Esaki, Ann. Ent. Soc. America, xvii, p. 228 (1924); Ann. Mus. Nation. Hungar., xxiii, p. 156 (1926).

Type:—*Strongylovelis formosa* Esaki.

Two species.

1. *Strongylovelis formosa* Esaki.

*Strongylovelis formosa* Esaki, Ann. Ent. Soc. Amer., xvii, p. 229, figs. (1924); Ann. Mus. Nation. Hungar., xxiv, p. 183 (1926).

Habitat:—Formosa.

2. *Strongylovelis albicollis* Esaki.

*Strongylovelis albicollis*, Esaki, Ann. Mus. Nation. Hungar., xxiii, p. 156 (1926).

[III] *Entomovelis* Esaki, 1928.

Described in the present paper (1928).

Type:—*Entomovelis doveri* Esaki.

One species.

1. *Entomovelis doveri* Esaki.

Described in the present paper (1928).

Habitat:—Malay Peninsula,

[IV] *Halovelina* Bergroth, 1893.

*Halovelina* Bergroth, Ent. Month. Mag., xxix, p. 277 (1893). Esaki, Bull. Brooklyn Ent. Soc., xix, p. 29 (1924). Hale, Rec. S. Austral. Mus., iii, p. 202, 203 (1926). Esaki, Ann. Mus. Nation. Hungar., xxiii, p. 157; (Key to the species), p. 164 (1926).

Type:—*Halovelina maritima* Bergroth.

Six species.

1. *Halovelina papuensis* Esaki.

*Halovelina papuensis* Esaki, Ann. Mus. Nation. Hungar., xxiii, p. 160, fig. 12, a, b (1926).

Habitat:—New Guinea.

2. *Halovelina malaya* Esaki.

Described in the present paper (1928.)

Habitat:—Malay Peninsula.

3. *Halovelina amphibia* Bergroth.

*Halovelina amphibia* Bergroth, Wien. Ent. Zeit., xxv, p. 70 (1906). Esaki, Ann. Mus. Nation. Hungar., xxiii, p. 162 (1926).

Habitat:—New Guinea; E. Africa, (Zanzibar).

4. *Halovelina bergrothi* Esaki.

*Halovelina bergrothi*, Esaki, Ann. Mus. Nation. Hungar., xxiii, p. 161, fig. 12, c-e (1926).

Habitat:—New Guinea.

5. *Halovelina maritima* Bergroth.

*Halovelina maritima* Bergroth, Ent. Month. Mag., xxix, p. 277 (1893). Hale, Rec. S. Austral. Mus., iii, p. 203 (1926). Esaki, Ann. Mus. Nation. and Hungar., xxiii, p. 162 (1926).

Habitat:—New Guinea, Cartier Island, Australia.

6. *Halovelina septentrionalis* Esaki.

*Metrocoris* sp., Yano, Hakubutsu no Tomo (Naturalists' Companion), Tokyo, vii, p. 289 (1907).

*Metrocoris* (?) sp., Miyake, Konchugaku Hanron (General Treatise on Entomology), ii, p. 502, fig. 299, B (1919).

*Halovelina maritima*, Esaki, nec Bergroth, Bull. Brooklyn Ent. Soc., xix, p. 30, figs. 1-5 (1924).

*Halovelina septentrionalis* Esaki, Ann. Mus. Nation. Hungar., xxiii, p. 162, fig. 12, f (1926); loc. cit., xxiv, p. 183 (1926).

Habitat:—Japan, Formosa.

### III. NEW MALAYAN BUPRESTIDAE.

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This paper is the result of a study of Buprestid Beetles mostly obtained by Mr. H. M. Pendlebury, Entomologist of the Federated Malay States Museums. This collection contained many interesting species of the older writers and also a number of new species, which are described in the present paper.

My sincere thanks are extended to Mr. C. Boden Kloss, Director of Museums, Straits Settlements and Federated Malay States, for the privilege of studying this interesting collection of Buprestidae and for his kindness in permitting me to deposit the types of the new species in the United States National Museum Collection.

*Iridotaenia insularis* sp. n.

Uniformly bronzy-green above, with a distinct purplish tinge along the lateral margins of the elytra, especially behind the middle; head aureous in front but becoming greenish-black on the vertex and occiput; antennae black, except the three or four basal joints, which are dark green; pronotum with a large elongate cupreous spot on each side along the lateral margin, the spot not extending to the base or apex, and covered with golden yellow efflorescence; beneath golden green, with a vague cupreous reflection in certain lights, and the legs slightly more greenish.

Head with a deep, oval, concave depression in front, the depression extending from the front of the epistoma to the vertex, and laterally to near the eyes, and with a deep, narrow, longitudinal groove in the middle of the depression on vertex and upper half of front; surface finely, sparsely punctate, with numerous coarse, irregularly distributed punctures intermixed, more or less transversely rugose behind the epistoma, and sparsely clothed with short, inconspicuous hairs in the depression; epistoma semicircularly emarginate in front, and the surface densely, finely granulose.

Pronotum strongly transverse, and slightly narrower at apex than base; sides strongly sinuate from apex to middle, then nearly parallel to the posterior angles; anterior margin slightly sinuate, with the median lobe broadly, feebly rounded; base feebly bisinuate, with the median lobe feebly, angularly produced; disk rather broadly, vaguely depressed on each side behind the anterior margin, the cupreous spot on each side more or less irregularly depressed, and with a vague, narrow median groove extending from anterior margin to base; surface vaguely granulose, finely, rather densely, and regularly punctate, with numerous coarse, irregularly distributed punctures intermixed, and



more or less rugose toward the sides in the cupreous spots. Scutellum small, elongate, broadly expanded behind, and feebly, longitudinally depressed at the middle.

Elytra slightly wider than pronotum at base; sides broadly rounded at humeral angles, slightly sinuate and nearly parallel to behind the middle, then arcuately narrowed and strongly dentate to the tips, which terminate in a small sutural spine; each elytron with a vague, broad, elongate depression along sutural margin behind middle, and the surface rather densely, coarsely, irregularly punctate, feebly rugose, and the punctures tending to form vague striae in the sutural region.

Abdomen beneath sparsely, irregularly punctate at the middle, finely, densely punctate toward the sides, where the surface is densely clothed with long, recumbent white pubescence and pale yellowish efflorescence; first segment broadly gibbose between the posterior coxae; last segment strongly narrowed to apex, which is broadly, deeply, arcuately emarginate. Prosternal process flat, and very sparsely, coarsely punctate.

Length, 26 millimeters; width, 8 millimeters.

*Type locality*.—Langkawi Islands, West Coast, Malay Peninsula.

*Type*.—United States National Museum.

Described from a single specimen collected at the type locality, May 1, 1928, by H. M. Pendlebury.

This species is closely allied to *Iridotaenia plicata* described by Kerremans from Sumatra, but *plicata* differs from it in being more uniformly purplish, the pronotum longer than wide, and the elytra expanded behind the middle.

*Exagistus atroviridis* sp. n.

Form elongate, slender, rather strongly flattened above, and strongly attenuate posteriorly; head reddish cupreous in front, bright green along the anterior margin and inner margin of eyes, and becoming dark brown on the occiput; pronotum and elytra subopaque, dark olivaceous green, with a vague purplish tinge, especially on the pronotum; beneath golden green, strongly shining, the sides densely clothed with yellowish pubescence, and the legs of a slightly darker green color than the abdomen.

Head with the front very wide, flat, slightly wider at bottom than top, and without distinct depressions; surface coarsely, irregularly, longitudinally rugose, coarsely, irregularly punctate between the rugae, and the punctures more or less confluent; epistoma very short, scarcely separated from the front of head, and the anterior margin feebly, broadly, arcuately emarginate; eyes rather small, and

broadly, oblong; antennae extending to basal third of pronotum, serrate from the fourth joint, and the outer joints as wide as long.

Pronotum nearly two times as wide as long, and about equal in width at base and apex; sides nearly parallel and vaguely constricted at middle; anterior margin transversely truncate; base strongly, arcuately emarginate at middle of each elytron, and the median lobe strongly produced and broadly rounded; disk strongly convex, with a very broad, shallow median depression extending from scutellum to near the anterior margin; surface very coarsely, densely, confluent punctate. Scutellum small, about as wide as long, truncate at base, broadly rounded at apex, and the surface slightly depressed at middle.

Elytra slightly wider than pronotum at base; sides broadly rounded at humeral angles, nearly parallel to behind middle (vaguely constricted in front of middle), then obliquely narrowed to the tips, which are separately subtruncate, obliquely emarginate, with the sutural tooth slightly longer than the lateral tooth; disk strongly flattened, sutural margins not distinctly elevated posteriorly, and with a few small, irregular depressions along the base; surface with distinct rows of coarse punctures, with the intervals rugose, and finely, rather densely punctate.

Abdomen beneath coarsely, densely punctate on basal segments, the punctures becoming finer toward the apex, and the sides of the segments broadly, densely clothed with recumbent yellowish pubescence and efflorescence, which conceals the surface; last segment broadly, transversely truncate at apex. Prosternum nearly flat, coarsely, confluent punctate, and without a prosternal lobe; prosternal process broad, slightly expanded behind the coxal cavities, then strongly narrowed to the apex, which is acute.

Length, 11.5 millimeters; width, 3.25 millimeters.

*Type locality*.—Kedah Peak, Malay Peninsula.

*Type*.—United States National Museum.

Described from a single specimen collected at the type locality at an elevation of 1000 feet, on March 28, 1928, by H. M. Pendlebury.

This species is allied to *Exagistus igniceps* described by Deyrolle from Borneo, but *igniceps* differs from it in coloration, the sides of the pronotum are distinctly expanded posteriorly, and the abdomen is only vaguely punctured beneath.

***Blepharum leopardum* sp. n.**

Elongate, subparallel, and strongly attenuate posteriorly; above black, with a distinct greenish tinge, especially on the head, and ornamented with numerous, irregular golden yellow spots; beneath greenish-black, more shining than above, and ornamented with golden yellow spots similar to

the dorsal surface; legs green, with a distinct aeneous tinge, and each femora ornamented on the underside with a small yellow spot.

Head with the front wide, flat, slightly wider at bottom than top, the sides feebly, obliquely converging toward the top, and without depressions; surface coarsely, deeply, confluent punctate, the punctures somewhat elongate on the front, but becoming round on the occiput, and ornamented with four yellow spots, two round ones on the vertex, and a triangular one on each side behind the antennal cavity along the margin of the eyes; epistoma broadly, arcuately emarginate in front, with the lateral lobes broadly rounded; eyes rather small, and broadly oblong; antennae extending beyond middle of pronotum, joints five to ten subtriangular, slightly longer than wide, and the last joint ovate.

Pronotum strongly transverse, trapezoidal, distinctly narrower at apex than base, and widest at base; sides nearly parallel (vaguely arcuately rounded) from the apical angles to basal fourth, then strongly, obliquely expanded to the posterior angles, which are subacute; anterior margin feebly sinuate, with the median lobe broadly rounded, but scarcely produced; base feebly, obliquely arcuate from the posterior angles to median lobe, which is angularly produced in front of the scutellum; disk moderately convex, with a broad, shallow depression in front of scutellum, and a small round, deep depression on each side along base near posterior angles; surface rather coarsely, densely punctate, and ornamented on each side with yellow markings as follows: a narrow, irregular-shaped fascia along lateral margin extending from anterior margin to near the base, a round spot along anterior margin near middle, and behind it a narrow vitta extending from middle to basal fifth. Scutellum small, punctiform, and situated in a shallow basal depression, common to both elytra.

Elytra about as wide as pronotum at base; sides arcuately expanded behind base, feebly, obliquely narrowed to behind the middle, then more strongly, arcuately narrowed to the tips, which are separately, deeply emarginate, with the two teeth about equal in length; lateral margins coarsely serrate; disk moderately convex, without basal depressions, but with a broad scutellar depression, and the sutural margins rather strongly elevated behind the middle; surface distinctly, longitudinally striate, coarsely, rather densely punctate in the striae, the punctures in the outer striae more or less confluent, the intervals rather strongly convex, and irregularly, obsoletely punctate, and each elytron ornamented with from fifteen to twenty small, irregular shaped yellow spots.

Abdomen beneath finely, rather densely punctate, very sparsely clothed with short, inconspicuous hairs, and ornamented with many irregular shaped yellow spots, which

tend to form five longitudinal rows; last segment subtruncate at apex, and armed with a long, narrow spine, which is truncate at the apex. Prosternal parts ornamented with yellow markings similar to the abdomen. Prosternum sparsely, finely punctate, sparsely clothed with short recumbent hairs, and the anterior margin truncate; prosternal process flat, narrowly grooved along the sides, and broadly rounded at the apex. Posterior coxae subparallel, and the anterior and posterior margins strongly sinuate. Legs not very robust; femora slightly fusiform and feebly flattened; tibiae straight and cylindrical; tarsi rather short, the first joint of the posterior pair about as long as the following two joints united, and the joints strongly expanding toward the last joint; tarsal claws with a broad, obtuse tooth at base.

Length, 14–16 millimeters; width, 4.5–5 millimeters.

*Type locality*.—Kedah Peak, Malay Peninsula.

*Type and paratype*.—United States National Museum.

*Paratypes*.—Selangor Museum, Kuala Lumpur, Federated Malay States.

Described from four specimens collected at the type locality at an elevation of from 3,000 to 3,950 feet, between March 12 and 25, 1928, by H. M. Pendlebury.

The specimens examined show very little variation except in the size and shape of the orange yellow markings, which are irregularly distributed over the entire insect, and this species can be easily distinguished from all the other described species of this genus by these markings.

#### *Chrysopistus aeneoviridis* sp. n.

Uniformly bronzy-green above, with a slight bluish reflection along the sutural margins behind the scutellum; antennae greenish-blue basally, but becoming paler toward the apex; beneath bronzy-green, with a slight cupreous reflection, and the legs greenish or violaceous blue.

Head slightly depressed in front, the depression extending from the vertex to epistoma, and laterally to the eyes, and with a deep, narrow, longitudinal groove at the middle of the depression; surface coarsely, irregularly punctate, with numerous very fine punctures intermixed, and sparsely clothed with erect, inconspicuous hairs; epistoma broadly, arcuately emarginate in front, and with a strongly elevated carina just behind the anterior margin; eyes oblong, and slightly projecting; antennae extending to middle of pronotum, and the outer joints feebly serrate.

Pronotum strongly transverse, and narrower at apex than base; sides obliquely narrowed near apex, then feebly, obliquely expanded to posterior angles, except for a broad, vague constriction at basal third; anterior margin broadly, arcuately emarginate, and slightly elevated; base bisinuate,

with the median lobe broadly, feebly angulated; disk feebly constricted along anterior margin, and with a broad, vague depression on each side behind the middle; surface coarsely, rather densely, and irregularly punctate, with numerous very small punctures intermixed, and clothed with a few inconspicuous hairs toward the sides. Scutellum punctiform, and only vaguely visible in a small emargination in the elytra a short distance behind the pronotum.

Elytra slightly wider than pronotum at base; sides rounded at humeral angles, nearly parallel to behind the middle, where they are broadly expanded, then arcuately attenuate and strongly dentate to the tips, which terminate in a strong apical spine; each elytron with four broad, vague, longitudinal costae, and the surface rather densely, finely, irregularly punctate.

Abdomen beneath nearly smooth at the middle, finely, densely punctate toward the sides, where the surface is also densely clothed with short, recumbent, white pubescence, and each segment with a broad, shallow depression on each side; last segment subtruncate at apex. Prosternal process flat and very coarsely, irregularly punctate. Posterior coxae narrowed externally and not emarginate on posterior margin. Anterior and middle femora strongly reflexed, but not clothed with conspicuous long hairs, the posterior pair with the margins parallel to each other. Anterior tibiae arcuate, short, and with a distinct carina; middle and posterior pairs longer, and only vaguely arcuate.

Length, 20 millimeters; width, 8 millimeters.

*Type locality*.—Perak, Federated Malay States.

*Type*.—United States National Museum.

Described from a unique female collected at the type locality.

This species is very similar to *Chrysopistus deyrollei* Théry (*Philocteanus flammeus* Deyrolle, not Thomson), but differs from it in having the sides of the pronotum more obliquely expanded posteriorly, and of a uniform bronzy green color above.

*Cyphogastra malayensis* sp. n.

Elongate and strongly attenuate posteriorly; head and pronotum purplish black, the latter with the lateral depressions cupreous or aureous; elytra bronzy green, with a cupreous or aureous reflection in certain lights, the apex bluish black, and the intervals with a more or less purplish reflection; beneath golden green, with a distinct cupreous tinge.

Head with a broad triangular depression in front, at the base of which is a transverse, sinuate carina, and with a deep, narrow, longitudinal groove extending from the carina to vertex; surface very sparsely, irregularly punctate;

epistoma depressed, broadly, arcuately emarginate in front, with a transverse semicircular carina, behind which are two broad, deep depressions; antennae extending to anterior coxal cavities, black, slender, and the third and fourth joints subequal in length.

Pronotum strongly transverse, and wider at base than apex; sides nearly parallel to each other posteriorly, feebly expanded at the posterior angles, and strongly constricted at the anterior angles; anterior margin strongly bisinuate, with the median lobe broadly rounded, and vaguely emarginate at the middle; base bisinuate; disk with a broad, longitudinal depression extending from anterior margin to base, a very broad, deep, irregular depression on each side, and with a deep fovea near the posterior angles; surface coarsely, sparsely, irregularly punctate, except in the lateral depressions where the surface is more finely and densely punctate. Scutellum small, elongate, trapeziform, but not depressed at middle.

Elytra distinctly wider than pronotum at base, and obliquely truncate at the humeri; sides parallel to just behind the middle, then obliquely narrowed to near the tips, which are more or less elevated, and coarsely dentate; disk without distinct costae except at base, and each elytron with two vague elongate depressions behind the middle, one along the sutural margin, the other along the lateral margin, but without a distinct depression behind the humerus; surface coarsely, densely punctate, and somewhat rugose in the basal region, but the punctures finer and sparser toward the apex.

Abdomen beneath with two longitudinal vittae on each side, converging to the apex, and composed of short, recumbent, whitish pubescence; surface at middle and between the vittae sparsely, coarsely punctate, and in the pubescent areas the surface is very finely and densely punctate. Prosternum with a few coarse, scattered punctures, and a broad, deep, longitudinal depression at the middle, which is densely, coarsely punctate, and rather densely pubescent at the bottom.

Length, 26–28 millimeters; width, 8–8.5 millimeters.

*Type locality*.—Malay Peninsula.

*Type*.—United States National Museum.

*Paratype*.—Selangor Museum, Kuala Lumpur, Federated Malay States.

Described from two females, which are simply labelled "Malay Peninsula," without any additional locality given. The paratype is slightly more cupreous above than the type, but otherwise is the same.

The species is closely allied to *farinosa* Fabricius, but that species is of a different color, and the depressions on the elytra are longer, quite distinct, and of a cupreous color.

*Cyphogastra intrusa* was described by Deyrolle from the Peninsula of Malacca, but no specimens which agree with his description have been seen by the writer. In his original description he states that the color above is black, with the sides dark green. The species was also unknown to Kerremans, but in his *Monographie des Buprestides*, vol. 4, 1910, p. 164, he places it with the species having the elytra arcuately attenuate posteriorly, and the apex not elevated.

***Lampra pubescens* sp. n.**

Form elongate, subcylindrical, and strongly shining; head golden green, with a large diamond shaped black spot on the vertex and occiput; pronotum golden green, with five small, irregular shaped black spots, four placed transversely in a single row at middle, and a narrow one on median line near anterior margin; elytra golden green, and each elytron ornamented with five irregular shaped black spots; beneath bright green, with a distinct golden tinge.

Head with the front nearly flat, broadly, deeply depressed around the base of antennae, nearly two times as wide at bottom as at top, the lateral margins strongly, obliquely narrowed from bottom to top, and with a broad, vague depression behind the epistoma; surface coarsely, confluent-punctate, except on the black area where the surface is smooth, the punctures large, round, and very shallow, and sparsely clothed with a few inconspicuous hairs.

Pronotum nearly two times as wide as long, distinctly wider at base than apex, and equal in width at base and middle; sides arcuately rounded from apical angles to near base, then obliquely expanded to posterior angles, which are acute; anterior margin feebly, arcuately emarginate, with a broad, vague median lobe; base strongly bisinuate, with the median lobe broadly rounded, but only feebly produced; disk moderately convex, with a broad, shallow depression along the base; surface coarsely, confluent-punctate, except on the black spots, and sparsely clothed with short, recumbent yellowish hairs. Scutellum rather small, and strongly transverse.

Elytra as wide as pronotum at humeral angles, which are broadly rounded; sides nearly parallel to behind the middle (broadly, vaguely constricted in front of middle), then obliquely narrowed to the tips, which are separately, acutely angulated, strongly serrate, and the serration extending forward along the lateral margins to near the middle; disk strongly, regularly convex, and with a few vague depressions at base; surface distinctly stria-punctate, the intervals finely, densely granulose or scabrous, and rather densely clothed with recumbent golden yellow hairs (except on the black spots which are glabrous), but the hairs not concealing the surface.

Abdomen beneath coarsely, rather densely punctate except at sides of basal segment, the punctures shallow, semicircular, and distinctly separated from each other, and sparsely clothed with long, fine, recumbent hairs; last segment deeply, semicircularly emarginate at the apex, with a vague, obtuse tooth at the middle of the emargination. Prosternum flat, very coarsely, confluent punctate, and clothed with a few long, erect hairs.

Length, 10.5 millimeters; width, 3.75 millimeters.

*Type locality*.—Perak, Federated Malay States.

*Type*.—United States National Museum.

Described from a single specimen collected at Batang Padang, Jor Camp, 1,800 feet, Perak, Federated Malay States, on June 4, 1923, by H. M. Pendlebury.

In general appearance this species resembles *Lampra semperi* Saunders, but differs from it in being more elongate and slender, the sides of the pronotum sinuate, the surface ornamented with five black spots, and the elytra clothed with golden yellow pubescence.

***Chrysobothris strigicollis* sp. n.**

Form moderately convex; head reddish brown, the occiput, anterior and lateral margins, and epistoma bright green, with a more or less golden tinge; pronotum reddish brown, the anterior margin, longitudinal vitta, and small spot in front of scutellum bright green, and a large fiery red spot covering the posterior lateral areas; scutellum bright green; elytra violaceous blue, and each elytron ornamented with bright green as follows: A narrow vitta along sutural margin at basal third, an elongate spot in basal depression, a similar spot at humerus, a round depressed spot on disk just in front of middle, and a similar transverse depressed spot just behind the middle; beneath the median part of body and upper side of legs are golden green, the sides of body and underside of legs reddish-brown, and the tarsi violaceous blue.

Head with the front strongly triangular and the surface sparsely clothed with long, fine cinereous hairs; occiput very narrow, longitudinally carinate, and the surface coarsely, densely punctate, the punctures becoming confluent along the eyes; vertex with a broad, transverse arcuate ridge, which does not protrude over the front nor extend to the lateral margins, and the surface punctured similar to occiput; front broadly, rather deeply concave, the surface of the concavity somewhat irregularly, concentrically striolate, with the center near the epistoma, the striae widely separated, the intervals nearly smooth, and along the lateral margins coarsely, confluent punctate; eyes large and nearly contiguous on occiput; epistoma large, very deeply, triangularly emarginate in front, with the anterior



margin rectangular on each side of the emargination; antennae purplish brown, with the basal joints golden green.

Pronotum about two times as wide as long, moderately convex, and slightly narrower at apex than base; sides nearly parallel from posterior angles to apical fifth (vaguely sinuate at middle), then strongly, obliquely narrowed to the apical angles; anterior margin transversely truncate, and without a median lobe; base broadly, arcuately emarginate on each side, with the median lobe strongly produced, and narrowly rounded; surface without depressions, but coarsely, transversely rugose on the disk, the rugae becoming oblique toward the sides, sparsely, finely punctate between the rugae, and coarsely punctate on the red areas near posterior angles. Scutellum small, triangular, with the three sides about equal in length, and the surface vaguely granulose.

Elytra distinctly wider than pronotum, and widest at middle; sides broadly rounded at humeral angles, feebly expanded to middle, then obliquely narrowed to the tips, which are separately, acutely rounded; lateral margins strongly serrate along apical half; base strongly lobed; disk with broad shallow basal depressions, the two posterior green spots feebly depressed, and each elytron with a vague sinuate longitudinal costa at some distance from the sutural margin behind middle; surface densely, coarsely, uniformly punctate.

Abdomen beneath sparsely punctate on the median parts, becoming irregularly striolate toward the sides, and sparsely clothed with short, inconspicuous hairs; last segment with two arcuate emarginations at apex, and with a strongly elevated carina extending the entire length of segment. Prosternum nearly flat, very coarsely, transversely rugose, and sparsely clothed with long, very fine, erect hairs. Femora robust, and the anterior pair with a broad obtuse tooth on outer margin near middle.

Length, 11.5 millimeters; width, 5 millimeters.

*Type locality*.—Peninsular Siam.

*Type*.—United States National Museum.

Described from a single specimen collected at Nakon Sri Tamarat, Khao Luang, 2,000 feet, Peninsular Siam, on March 11, 1922, by H. M. Pendlebury.

This species resembles *dissimilis* Deyrolle, but differs from it in having the eyes nearly contiguous on occiput, the ridge on vertex not projecting over the front of head, sides of pronotum more parallel to each other, and not widest near apex, and also by the coloration and arrangement of the green markings on the pronotum and elytra.

*Chrysobothris malayensis* sp. n.

Form moderately convex; head purplish brown, with the occiput, anterior and lateral margins, and epistoma

bronzy green; pronotum aeneous or cupreous brown, vaguely greenish along anterior margin, and the posterior lateral areas broadly fiery red; scutellum aeneous; elytra purplish black, with a vague greenish reflection, and each elytron ornamented with bright green markings as follows: A round spot in basal depression, an elongate spot at humerus, a round depressed spot on disk just in front of middle, and a similar spot near apical third, and slightly exterior to the median spot; body beneath golden green on the median parts, but becoming bluish black at the sides and on under-side of legs.

Head with the front strongly triangular, and the surface sparsely clothed with fine, long cinereous hairs; occiput very narrow, feebly, longitudinally carinate, and the surface coarsely, confluent punctate; vertex with a broad, transverse arcuate ridge, which projects slightly over the front, and extending nearly to the lateral margins, and the surface more sparsely, irregularly punctate than on occiput; front broadly, very deeply concave, the surface of the concavity somewhat irregularly, concentrically striolate, with the center near the epistoma, the striae widely separated, the intervals nearly smooth, and along lateral margins coarsely, confluent punctate; eyes large and nearly contiguous on occiput; epistoma large, broadly, arcuately emarginate in front, with the anterior margin broadly rounded on each side of the emargination; antennae greenish black, with the basal joints bronzy cupreous.

Pronotum two times as wide as long, moderately convex, and distinctly narrower at apex than base; sides nearly parallel and strongly bisinuate from base to apical fourth, then obliquely narrowed to the apical angles; anterior margin nearly transversely truncate, and without a distinct median lobe; base broadly, arcuately emarginate on each side, with the median lobe strongly produced, broadly rounded, and truncate in front of scutellum; surface without depressions, but coarsely, closely, transversely rugose, and rather densely punctate between the rugae, the punctures fine on the median part, but becoming much coarser and denser toward the sides. Scutellum small, triangular, with the three sides equal in length, and the surface obsoletely granulose.

Elytra distinctly wider than pronotum, and only vaguely wider behind the middle than at humeral angles, which are broadly rounded; sides nearly parallel to behind the middle, then arcuately narrowed to the tips, which are acutely angulated; lateral margins coarsely serrate from apex to basal fourth, the teeth becoming more obsolete and widely separated anteriorly; base strongly lobed; disk broadly, feebly depressed inside of humeri, the basal and two median green spots distinctly depressed, and each

elytron with three vague longitudinal costae, one along lateral margin, and two on the median part; surface densely, coarsely, uniformly punctate.

Abdomen beneath finely, sparsely punctate on the median parts, becoming irregularly striolate toward the sides, and sparsely clothed with short, recumbent hairs; last segment semicircularly emarginate at apex, and with a strongly elevated longitudinal carina extending the entire length of segment. Prosternum flat, very coarsely, transversely rugose, and sparsely clothed with long, very fine, erect hairs. Femora robust, and the anterior pair with a broad, obtuse tooth on outer margin at apical third.

Length, 14 millimeters; width, 5.5 millimeters.

*Type locality*.—Perak, Federated Malay States.

*Type*.—United States National Museum.

Described from a single specimen labeled "Kuala Kangsar, Perak, F. M. S."

This species resembles *pictiventris* Saunders, but differs from it in being more elongate, and more strongly narrowed posteriorly, the ridge on vertex projecting over the front of head, and by the different arrangement of the green markings on the elytra.

*Chrysobothris viduus* sp. n.

Form moderately convex; head purplish black, with the occiput, vertex, anterior and lateral margins, and epistoma dark green; pronotum reddish brown, vaguely greenish between the rugae and along anterior margin, and with a large golden green spot covering the posterior lateral areas; scutellum purplish black, with a vague greenish reflection; elytra purplish black, with a distinct reddish reflection, and each elytron ornamented with bluish green markings as follows: A vague vitta along sutural margin at basal fourth, a small round spot in basal depression, a small elongate spot at humerus, a small, round, vaguely depressed spot on disk just in front of middle, and a similar spot at apical third, slightly exterior to the median spot; body beneath violaceous green on the median parts becoming broadly reddish brown at the sides and on underside of legs, and the tarsi cyaneous.

Head with the front strongly triangular, and sparsely clothed with long, fine cinereous hairs; occiput very narrow, feebly longitudinally carinate, and the surface coarsely, confluent punctate; vertex with a broad, transverse, vaguely sinuate ridge, which projects slightly over the front, and extending to the lateral margins, and the surface punctured similar to that of the occiput; front broadly, very deeply concave, the surface of the concavity irregularly, transversely striolate, the striae widely separated, the intervals smooth, and coarsely, confluent punctate along lateral margins; eyes large, and narrowly separated on the occiput;

epistoma large, broadly, deeply, arcuately emarginate in front, with the anterior margin obtusely rounded on each side of the emargination; antennae bronzy green, with the outer part of the serrate joints brownish yellow.

Pronotum nearly two times as wide as long, feebly convex, slightly wider at apex than base, and widest at apical fifth; sides strongly, obliquely expanded from apical angles to apical fifth, then vaguely narrowed and slightly sinuate to the posterior angles; anterior margin transversely truncate, and without a median lobe; base broadly, arcuately emarginate on each side, with the median lobe strongly produced, broadly rounded, and truncate in front of scutellum; surface without depressions, but coarsely, closely, transversely rugose, and rather densely punctate between the rugae, the punctures fine on the median parts, but becoming coarser and denser toward the sides. Scutellum small, triangular, with the sides about equal in length, and the surface obsoletely granulose.

Elytra distinctly wider than pronotum, widest at middle, and the humeral angles broadly rounded; sides feebly expanded from humeral angles to middle, where they are broadly rounded, then arcuately narrowed to the tips, which are acutely angulated; lateral margins coarsely serrate along apical half; base strongly lobed; disk with small, round, moderately deep basal depressions, the two median green spots vaguely depressed, and each elytron with two vague longitudinal costae posteriorly, one along lateral margin, and the other near sutural margin; surface densely, coarsely, uniformly punctate.

Abdomen beneath finely, sparsely punctate at middle, irregularly striolate at the sides, and clothed with a few recumbent hairs; last segment very deeply arcuately emarginate at apex, and with a strongly elevated longitudinal carina extending from apex to basal third of segment. Prosternum flat, coarsely, transversely rugose, and sparsely clothed with long, erect hairs. Femora robust, and the anterior pair with a broad, obtuse tooth on outer margin at apical third.

Length, 12 millimeters; width, 5 millimeters.

*Type locality*.—Perak, Federated Malay States.

*Type*.—United States National Museum.

Described from a single example labeled "Malay Peninsula, Perak, F. M. S., from Coll. Perak Mus.: C. Wray."

This species is very closely allied to *malayensis* Fisher, but differs from it in being shorter, more strongly depressed above, more obtusely narrowed posteriorly, the elytra widest at middle, and of a different color.

*Meliboecus angustatus* sp. n.

Elongate, slender, strongly convex, and attenuate posteriorly; head aeneous in front, becoming dark blue on

the occiput; scutellum dark brown; pronotum and elytra dark blue, the latter with a greenish tinge; beneath the anterior part of the body and legs bronzy brown, and the abdomen bluish black.

Head with the front rather narrow, strongly convex, slightly wider at top than bottom, the sides feebly expanding toward the top, not gibbose on the vertex, but with a vague, longitudinal depression on the front; surface coarsely, densely rugose, the rugae transverse on the front, becoming finer and concentric on the vertex, with a few fine punctures in the intervals, and sparsely clothed with recumbent yellowish hairs; epistoma broadly, but not deeply, arcuately emarginate in front.

Pronotum nearly two times as wide as long, slightly narrower at apex than base, and widest near middle; sides vaguely margined and crenulate, strongly arcuately rounded from apical angles to posterior angles, which are obtusely angulated; anterior margin broadly, deeply, arcuately emarginate, but without a distinct median lobe; base bisinuate, with a large median lobe, which is truncate in front of the scutellum; disk broadly gibbose on the median part, with a broad, irregular depression along lateral margins, extending from apical angles to the base, broadly depressed along the base, and with a broad, vague depression along the anterior margin; surface finely, irregularly rugose, the intervals nearly smooth, with a few small punctures connected to the rugae posteriorly. Scutellum triangular, very acute posteriorly, and the surface vaguely reticulate.

Elytra as wide as pronotum at base, and moderately convex; humeral angles obtusely rounded; sides nearly parallel to apical third (except for a broad, arcuate constriction in front of middle), then obliquely narrowed to near the tips, which are separately, broadly rounded, and feebly serrate; surface coarsely, densely, transversely rugose, the rugae becoming finer posteriorly, and with numerous coarse punctures connected posteriorly to the rugae.

Abdomen convex, shining, and densely marked with coarse crenulate lines; last segment subtruncate at apex, the surface broadly depressed at apex, and sparsely clothed with long recumbent hairs; pygidium armed with three large teeth at apex. Prosternum coarsely rugose, and sparsely clothed with semierect white hairs; prosternal process with the sides feebly narrowed to near the apex, which is rather acute. Tarsi and tarsal claws black; tarsal lamellae brownish.

Length, 4.5 millimeters; width, 1.7 millimeters.

*Type locality*.—Perak, Federated Malay States.

*Type*.—United States National Museum.

Described from a single example collected at Perak, Batang Padang, 3,500 feet, Federated Malay States, on October 11, 1923, by H. M. Pendlebury.

***Meliboeus exiguus* sp. n.**

Very small and slender, moderately convex, and strongly attenuate posteriorly; head aeneous; pronotum aureo-cupreous; elytra dark brown, with a feeble cupreous tinge; beneath dark brown, with a slight aeneous tinge.

Head with the front broad, strongly convex, about equal in width at top and bottom, the sides feebly sinuate and nearly parallel, and without gibbosities or depressions; surface finely, densely granulose, sparsely, finely punctate, and sparsely clothed with recumbent white hairs behind the epistoma; epistoma rather narrow between the antennae, the lateral margins slightly elevated, and the anterior margin semicircularly emarginate at the middle.

Pronotum nearly two times as wide as long, slightly wider at apex than base, and widest at middle; sides vaguely margined and crenulate, feebly sinuate, and rather strongly, arcuately rounded from apical angles to posterior angles, which are obtusely angulated; anterior margin feebly, arcuately emarginate, but without a distinct median lobe; base strongly bisinuate, with the median lobe rather strongly produced, and feebly emarginate in front of scutellum; disk broadly gibbose on the antero-median part, and broadly, irregularly depressed along the base and lateral margins; surface densely, irregularly rugose, rather densely, coarsely punctate, the punctures connected posteriorly to the rugae, and sparsely clothed in the depressed areas with short, recumbent, white hairs; intervals smooth. Scutellum triangular, very acute posteriorly, and the surface vaguely reticulate.

Elytra slightly wider than pronotum at base, rather strongly convex, and about equal in width at base and behind middle; humeral angles obtusely rounded; sides nearly parallel to apical third (broadly, arcuately constricted in front of middle), then obliquely narrowed to the tips, which are separately, broadly rounded, and feebly serrate; surface finely, transversely, irregularly rugose, rather densely, coarsely punctate, the punctures connected posteriorly to the rugae, and sparsely clothed with short, recumbent, inconspicuous hairs.

Abdomen beneath strongly convex, shining, rather densely, finely punctate, finely marked with irregular crenulate lines, and sparsely clothed with short, recumbent white hairs; last segment broadly, arcuately emarginate at apex, broadly but not deeply depressed, and sparsely clothed with long, semierect white hairs along apical margin; pygidium with a short, triangular tooth at apex, and the tooth turned slightly upward. Prosternum coarsely rugose,

and sparsely clothed with short, erect white hairs; prosternal process with the sides strongly narrowed to near the apex, which is acute. Tarsi and tarsal claws black: tarsal lamellae brownish-white.

Length, 3 millimeters; width, 1 millimeter.

*Type locality*.—Kedah, Catchment Area, near Jitra, Malay Peninsula.

*Type*.—United States National Museum.

Described from a single specimen collected at the type locality, April 4, 1928, by H. M. Pendlebury.

This species is closely allied to *dapitanus* described by Obenberger from the Philippine Islands, but *dapitanus* is more robust, less attenuate posteriorly, pronotum and elytra black and the former with a distinct purplish tinge, epistoma very narrow between the antennae, front of head narrow and the sides broadly constricted at the middle, and the pygidium is obtusely angulated at the apex.

*Meliboeus bicolor* sp. n.

Rather short, subparallel, strongly convex, and attenuate posteriorly; head and pronotum cupreous, with a distinct aureous tinge; elytra black, with a vague purplish reflection in certain lights; beneath aeneo-cupreous, and strongly shining.

Head with the front narrow, strongly convex, distinctly wider at top than bottom; the sides strongly expanding toward the top, and without gibbosities or depressions; surface sparsely, coarsely punctate, more or less transversely rugose behind the epistoma and on occiput, and clothed with a few short white hairs behind the epistoma; epistoma rather narrow between the antennae, the lateral margins slightly elevated, and broadly, rather deeply, arcuately emarginate in front.

Pronotum nearly two times as wide as long, distinctly narrower at apex than base, and widest at basal third; sides vaguely margined and crenulate, feebly sinuate, and rather strongly, arcuately rounded from apical angles to posterior angles, which are obtusely angulated; anterior margin strongly arcuately emarginate, but without a distinct median lobe; base strongly bisinuate, with a large median lobe, which is broadly truncate in front of scutellum; disk broadly gibbose on the antero-median part, with a broad, irregular depression along the lateral margins, extending from the apical angles to the base, and broadly depressed along the base; surface sparsely, finely punctate, more or less irregularly rugose at the sides, the intervals smooth, and the punctures connected by fine crenulate lines. Scutellum triangular, very acute posteriorly, and the surface smooth.

Elytra slightly wider than pronotum at base, moderately convex, and slightly wider at base than behind middle; humeral angles obtusely rounded; sides rather strongly, arcuately expanded behind the humeral angles, broadly, arcuately constricted in front of middle, broadly, arcuately expanded behind the middle, then obliquely narrowed to the tips, which are separately, broadly rounded, and feebly serrate; surface coarsely, rather densely, transversely rugose, the rugae becoming finer posteriorly, with numerous coarse, elongate punctures connected posteriorly to the rugae, and from each puncture arises a short, inconspicuous hair.

Abdomen beneath strongly convex, shining, and densely marked with coarse crenulate line; last segment broadly truncate at apex, broadly, feebly depressed at middle, and sparsely clothed with short, semierect white hairs along apical margin; pygidium broadly truncate at apex, the margin finely serrate, and with a vague tooth at middle and lateral angles. Prosternum coarsely rugose, and sparsely clothed with short, erect white hairs; prosternal process with the sides feebly narrowed to near the apex, which is rather acute. Tarsi and tarsal claws black; tarsal lamellae brownish-white.

Length, 3.75 millimeters; width, 1.5 millimeters.

*Type locality*.—Langkawi Islands, West Coast, Malay Peninsula.

*Type*.—United States National Museum.

Described from a single specimen collected at the type locality, April 14, 1928, by H. M. Pendlebury.

This species resembles *exiguus* Fisher, but that species is more strongly attenuate posteriorly, sides of the pronotum more strongly expanded, of a different color, and the pygidium is armed with a short, triangular tooth at the apex.

*Meliboeus insularis* sp. n.

Elongate, slender, subparallel, strongly convex, and attenuate posteriorly; head aeneous in front, but becoming dark blue on the occiput; pronotum, scutellum and elytra bright blue, with the pronotum distinctly cupreous toward the sides; beneath aeneo-cupreous, with a distinct purplish reflection, and the sides of the abdomen violaceous-blue.

Head with the front rather narrow, strongly convex, slightly wider at top than bottom, the sides feebly expanding toward the top, not gibbose on the vertex, and without a depression on the front; surface rather densely, coarsely, uniformly punctate, and sparsely clothed with short, semierect, inconspicuous hairs behind the epistoma; epistoma rather broad between the antennae, and broadly, but not deeply, arcuately emarginate in front.



Pronotum two-thirds wider than long, distinctly narrower at apex than base, and widest at basal third; sides vaguely margined and crenulate, slightly sinuate and feebly, arcuately rounded from apical angles to basal third, then obliquely narrowed to the posterior angles, which are obtusely angulated; anterior margin feebly, arcuately emarginate, but without a distinct median lobe; base strongly bisinuate, with a large median lobe, which is vaguely emarginate in front of scutellum; disk regularly convex, and broadly, vaguely depressed along base and toward the sides; surface rather sparsely, finely punctate, intervals smooth, and the punctures connected by fine crenulate lines. Scutellum triangular, very acute posteriorly, and the surface vaguely reticulate.

Elytra as wide as pronotum at base, and moderately convex; humeral angles obtusely rounded; sides nearly parallel to apical third (broadly, arcuately constricted in front of middle), then obliquely narrowed to the tips, which are separately, broadly rounded, and feebly serrate; surface finely, densely, transversely, rugose, and with numerous coarse, elongate punctures connected posteriorly to the rugae.

Abdomen beneath convex, shining, sparsely marked with fine transverse, crenulate lines, and sparsely, finely punctate; last segment broadly rounded at apex, and sparsely clothed with long, semierect white hairs; pygidium armed with a large, serrate spine at the apex. Prosternum coarsely rugose, and sparsely clothed with short, semierect white hairs; prosternal process with the sides feebly narrowed to near the apex, which is rather acute. Tarsi and tarsal claws dark brown; tarsal lamellae brownish-white.

Length, 5 millimeters; width, 1.6 millimeters.

*Type locality*.—Langkawi Islands, West Coast, Malay Peninsula.

*Type*.—United States National Museum.

Described from a single specimen collected at the type locality, April 21, 1928, by H. M. Pendlebury.

This species is allied to *aeneifrons* described by Deyrolle from the island of Mysol, but *aeneifrons* is more strongly attenuate posteriorly, bronzy-green above, more coarsely rugose, head narrower in front and the sides broadly constricted at the middle, and the pygidium is obtusely angulated at the apex.

*Meliboeus insularis* var. *langkawicus* var. n.

This variety differs from the typical *insularis* as follows: Slightly larger and more robust; epistoma dark brown; head, pronotum, and elytra violaceous blue; beneath violaceous blue, strongly shining, and the legs dark brown.

Length, 5.75 millimeters; width, 2.1 millimeters.

*Type locality*.—Langkawi Islands, West Coast, Malay Peninsula.

*Type*.—United States National Museum.

*Paratype*.—Selangor Museum, Kuala Lumpur, Federated Malay States.

Described from two examples collected at the type locality, April 19 and 21, 1928, by H. M. Pendlebury.

This seems to be merely a local color variety of *insularis*, but it seems advisable to separate the two forms, at least, until a larger series can be studied.

*Agrilus malasicus* sp. n.

*Female*.—Form rather short and slender; head and pronotum bluish black, with a slight purplish tinge, and the head broadly aeneous behind the epistoma; elytra bright aureo-aeneous, with a vague purplish reflection toward the apex; beneath aeneous, with the legs more or less greenish.

Head with the front rather wide, slightly convex, about equal in width at bottom and top, the lateral margins feebly, arcuately expanded at vertex, and with a vague longitudinal groove on the occiput and vertex; surface densely, finely granulose, finely, sparsely punctate, somewhat transversely rugose, and with a few semierect white hairs along the eyes and behind the epistoma; epistoma strongly transverse between the antennae, distinctly elevated, subtruncate in front, and the surface densely granulose; antennae extending to middle of pronotum, serrate from the fourth joint, and the outer joints about as wide as long; eyes large, elongate, and equally rounded above and beneath.

Pronotum nearly one-third wider than long, slightly wider at apex than base, and widest at apical third; sides feebly arcuately rounded from apical angles to behind middle, then more strongly narrowed to near the posterior angles, where the sides are nearly parallel; when viewed from the side the marginal and submarginal carinae are slightly sinuate, narrowly separated, and connected to each other near the base; anterior margin strongly sinuate, and the median lobe slightly produced and broadly rounded; base arcuately emarginate at middle of each elytron, with the median lobe broadly rounded, and subtruncate in front of scutellum; disk moderately convex, a deep, narrow depression on each side extending from the apical angle obliquely backward to a broad, concave depression along the base, and with strongly elevated, arcuate prehumeral carinae, which extend from the posterior angles forward to near the lateral margins at middle; surface finely, closely, transversely rugose, and rather densely, finely punctate between the rugae. Scutellum strongly, transversely carinate, and the surface finely, densely reticulate.

Elytra slightly wider than pronotum at base, and equal in width at base and behind middle; sides feebly expanded behind the base, broadly, arcuately constricted in front of middle, broadly, arcuately expanded behind the middle, then obliquely narrowed to the tips, which are feebly, obliquely emarginate, and irregularly serrate; sides of the abdomen not exposed above; disk slightly flattened, sutural margins slightly elevated behind the middle, and with broad, shallow basal depressions; surface densely, finely scabrous or granulose, and each elytron ornamented with a broad, inconspicuous vitta of sparsely, evenly distributed short white hairs, extending along the sutural margin from the basal depression to apex.

Abdomen beneath densely, finely scabrous or rugose on basal segments, becoming finely punctate toward apex, and sparsely, uniformly clothed with short, recumbent yellowish hairs; first and second segments convex and without a groove at middle; vertical portions of the segments not conspicuously pubescent; pygidium longitudinally carinate, the carina not projecting, but the apex of the pygidium acutely triangular. Prosternum coarsely, densely scabrous, and sparsely clothed with recumbent yellowish hairs; prosternal lobe broad, moderately declivous, and broadly, vaguely emarginate or subtruncate in front; prosternal process broad, the sides nearly parallel to behind the coxal cavities, then strongly narrowed to the apex, which is acute. Tibiae slender, straight, and unarmed at apex. Posterior tarsi scarcely one-half as long as the tibiae, and the first joint about as long as the following three joints united. Tarsal claws similar on all feet, cleft near middle, the inner tooth broad, much shorter than outer one, and not turned inward.

Length, 5 millimeters; width, 1.3 millimeters.

*Type locality*.—Kedah, Catchment Area, near Jitra, Malay Peninsula.

*Type*.—United States National Museum.

Described from a unique female collected at the type locality, April 11, 1928, by H. M. Pendlebury.

*Agrius pendleburyi* sp. n.

*Female*.—Form rather short and elongate; head, pronotum, and basal half of elytra bright green, with a more or less bluish reflection, and the apical half of the elytra bronzy green at the sides, but becoming blackish toward the sutural margins; beneath bronzy green, with a feeble golden tinge.

Head with the front rather narrow, nearly flat, slightly wider at top than bottom, the lateral margins expanded at vertex, and with a broad, vague, longitudinal depression extending from occiput to epistoma; surface transversely rugose on the front, coarsely, densely punctate on the

occiput, and sparsely clothed with inconspicuous hairs; epistoma vaguely transverse between the antennae, strongly elevated, and transversely truncate in front; antennae extending to middle of pronotum, serrate from the fourth joint, and the outer joints slightly longer than wide; eyes large, elongate, and slightly more broadly rounded above than beneath.

Pronotum one-half wider than long, about equal in width at base and apex, and widest along middle; sides nearly parallel to each other, only vaguely arcuately rounded; when viewed from the side the marginal and submarginal carinae are very strongly sinuate, widely separated anteriorly, and connected to each other behind the middle; anterior margin slightly sinuate, and the median lobe feebly produced and broadly rounded; base acutely emarginate at middle of each elytron, with the median lobe very large, and broadly rounded; disk moderately convex, with a moderately deep depression on each side along lateral margin at middle, a broad, rather deep depression in front of scutellum, and with sharply defined, angular prehumeral carinae, the carinae extending from posterior angles obliquely inward to basal third, then turning obliquely outward for a short distance and forming a rectangle; surface glabrous, densely, coarsely scabrous, and more or less irregularly rugose. Scutellum strongly, transversely carinate, the surface smooth at the middle, and striate along the margins.

Elytra vaguely wider than pronotum at base, and about equal in width at base and behind middle; sides feebly expanded behind base, broadly, arcuately constricted in front of middle, arcuately expanded behind the middle, then obliquely narrowed to the tips, which are produced into a long, acute spine at middle; sides of abdomen narrowly exposed above; disk feebly convex, sutural margins feebly elevated behind middle, with broad, shallow basal depressions, and a very short, elevated carina at humeral angles; surface coarsely, densely scabrous on basal half, densely imbricate-punctate posteriorly, and sparsely clothed with long, whitish hairs along the sutural margins at apical fourth.

Abdomen beneath densely, coarsely scabrous or rugose on basal segments, but becoming finely punctate toward apex, and sparsely clothed with short, recumbent white hairs; first and second segments convex and without a groove at middle; vertical portions of segments not conspicuously pubescent; pygidium without a projecting carina. Prosternum coarsely, densely scabrous, and sparsely clothed with short inconspicuous hairs; prosternal lobe broad, moderately declivous, and broadly, arcuately emarginate in front; prosternal process very broad, strongly expanded behind the coxal cavities, and transversely truncate at apex, with an acute tooth at the middle. Tibiae slender, straight,

and unarmed at apex. Posterior tarsi scarcely one-half as long as the tibiae, and the first joint about as long as the following joints united. Tarsal claws similar on all feet, cleft near middle, the inner tooth broad, much shorter than outer one, and not turned inward.

Length, 7.75 millimeters; width, 2.25 millimeters.

*Type locality*.—Peninsular Siam.

*Type*.—United States National Museum.

Described from a unique female collected at Nakon Sri Tamarat, Khao Luang, 2,000 feet, Peninsular Siam, on March 20, 1922, by H. M. Pendlebury.

*Agrilus klossi* sp. n.

*Female*.—Form large, elongate, and strongly attenuate posteriorly; head brown in front, becoming olivaceous green on the vertex and occiput; pronotum bright cupreous red; scutellum black; elytra dark olivaceous green; beneath aeneous, and strongly shining.

Head with the front wide, flattened, slightly wider at bottom than top, the lateral margins strongly, arcuately expanded below the vertex, and vaguely depressed, with the depression extending to the lateral margins; surface densely, finely punctate, the punctures somewhat rectangular, more or less rugose, rather densely clothed with short, inconspicuous hairs, which do not conceal the surface, and densely efflorescent behind the epistoma; epistoma strongly transverse between the antennae, feebly elevated, and broadly, arcuately emarginate in front, with a distinct tooth on each side of the emargination; antennae extending to middle of pronotum, serrate from the fourth joint, and the outer joints as wide as long, eyes large, elongate, and about equally rounded above and beneath.

Pronotum nearly two times as wide as long, slightly wider at base than apex, and widest at middle; sides nearly parallel to each other, only feebly arcuately rounded; when viewed from the side the marginal and submarginal carinae are feebly sinuate, rather narrowly separated at the middle, and the submarginal carina more or less obsolete at each end; anterior margin rather strongly sinuate, and the median lobe slightly produced and broadly rounded; base arcuately emarginate at middle of each elytron, with the median lobe broadly rounded, and subtruncate in front of scutellum; disk moderately convex, vaguely, broadly depressed along anterior margin, a broad, round, deep depression in front of the scutellum, a deep, narrow depression on each side extending from the apical angles obliquely backward to the median depression, and with strongly elevated, arcuate prehumeral carinae, the carinae extending arcuately forward and connected to the lateral margins at apical third; surface finely, closely, transversely rugose, finely punctate between the rugae, and moderately clothed

with short, black, inconspicuous hairs. Scutellum not transversely carinate, but deeply depressed at middle, and the surface finely, densely reticulate.

Elytra distinctly wider than pronotum at base, and equal in width at base and behind middle; sides feebly expanded behind base, broadly, arcuately constricted in front of middle, arcuately expanded behind middle, then obliquely narrowed to the tips, which are conjointly arcuately emarginate, and forming a broad tooth at middle of each elytron; sides of abdomen rather broadly exposed above; disk feebly flattened, sutural margins slightly elevated behind middle, and with broad, moderately deep basal depressions; surface densely, finely scabrous or granulose, and densely, uniformly clothed with inconspicuous black hairs, which do not conceal the surface.

Abdomen beneath densely, finely punctate, more or less imbricate at sides of basal segment, and rather densely clothed with short, recumbent white hairs, which are more or less covered with white efflorescence at the sides; first and second segments convex and without a groove at middle; vertical portions of the segments not conspicuously pubescent; pygidium strongly, longitudinally carinate, the carina strongly projecting, and acute at apex. Prosternum coarsely, densely rugose, and sparsely clothed with short, semierect white hairs; prosternal lobe broad, strongly declivous, and feebly, arcuately emarginate in front; prosternal process broad, sides nearly parallel to behind the coxal cavities, then obliquely narrowed to the apex, which is obtusely rounded. Tibiae slender, straight, and unarmed at apex. Posterior tarsi nearly as long as the tibiae, and the first joint as long as the following joints united. Tarsal claws similar on all feet, cleft near middle, the inner tooth distinctly shorter than outer one, and feebly turned inward.

Length, 10.5 millimeters; width, 2.75 millimeters.

*Type locality*.—Pahang, Federated Malay States.

*Type*.—United States National Museum.

*Paratype*.—Selangor Museum, Kuala Lumpur, Federated Malay States.

Described from two females collected by H. M. Pendlebury at the type locality. The type was collected at Lubok Tamang, 3,500 feet, on June 24, 1923, and the paratype at Cameron's Highlands, No. 4 Camp, 4,800 feet, on October 15, 1923.

The paratype is similar to the type except that the color on the pronotum is darker, which is probably due to discoloration. This species is closely allied to *benguensis* Fisher, but in that species the elytra are more reddish, the tips are produced into an acute spine, and the posterior tarsi are distinctly shorter than the tibiae.

***Agrilus kedahae* sp. n.**

*Male.*—Form rather large, elongate, and strongly attenuate posteriorly; head bronzy green, becoming slightly darker green on the occiput; pronotum and elytra bottle green, the former aureous at the sides where the surface is also densely clothed with golden yellow pubescence and efflorescence; beneath aureo-aeneous, strongly shining, the sides of the mesosternum, metasternum, and vertical portions of the first abdominal segment densely clothed with golden yellow pubescence and efflorescence, and the legs slightly more greenish.

Head with the front wide, nearly flat, about equal in width at bottom and top, with a vague longitudinal groove on the occiput and vertex, and the lateral margins strongly, arcuately expanded at vertex, and arcuately constricted near the bottom; surface densely, coarsely granulose, becoming irregularly rugose on the occiput, and sparsely clothed near bottom with short, inconspicuous hairs; epistoma slightly transverse between the antennae, feebly elevated, and vaguely, arcuately emarginate or subtruncate in front, with a distinct tooth on each side of the emargination; antennae extending to middle of pronotum, serrate from the fourth joint, and the outer joints as wide as long; eyes large, somewhat kidney-shaped, and more broadly rounded beneath than above.

Pronotum two-fifths wider than long, wider at apex than base, and widest along apical third; sides nearly parallel from apical angles to behind middle, then obliquely narrowed to the posterior angles; when viewed from the side the marginal carina is strongly sinuate, the submarginal carina nearly straight, the two carinae widely separated anteriorly, and narrowly separated posteriorly for their entire length; anterior margin strongly sinuate, and the median lobe rather strongly produced and broadly rounded; base angularly emarginate at middle of each elytron, with the median lobe broadly truncate in front of scutellum; disk moderately convex, broadly, transversely concave along the base, with a deeper, round depression in front of scutellum, a very deep, broad depression on each side along lateral margin, and with very strongly elevated, arcuate prehumeral carinae, which extend forward and are connected to the lateral margins at middle; surface finely, densely granulose, finely punctate, vaguely rugose, and ornamented with a large spot of dense golden yellow pubescence and efflorescence in the depression on each side along lateral margin. Scutellum strongly, transversely carinate, and the surface densely, finely reticulate.

Elytra distinctly wider than pronotum at base, and slightly wider at base than behind middle; sides slightly expanded behind base, broadly, arcuately constricted in front of middle, broadly, arcuately expanded behind middle, then obliquely narrowed to the tips, which are separately

broadly rounded, strongly serrate, and with a long, slender tooth at the middle of each elytron; sides of abdomen broadly exposed above; disk vaguely flattened anteriorly, sutural margins scarcely elevated posteriorly, and with broad, deep basal depressions; surface densely, finely granulose, and sparsely clothed with short, recumbent inconspicuous hairs.

Abdomen beneath coarsely, densely rugose on basal segments, becoming finely, sparsely punctate toward apex, sparsely clothed with short, recumbent white hairs, the hairs slightly denser and forming obsolete spots on each side of the first, third, and fourth segments; first segment slightly flattened and sparsely clothed with long, erect white hairs at middle; second segment with a small, very shallow smooth depression at middle along anterior margin; vertical portions of the first segment densely clothed with orange yellow pubescence and efflorescence, but the other segments more sparsely pubescent; pygidium strongly, longitudinally carinate, the carina projecting and acute at apex. Prosternum coarsely, densely rugose, and rather densely clothed at the middle with long, erect white hairs, the hairs extending along middle of body to the second abdominal segment; prosternal lobe broad, moderately declivous, and broadly, vaguely emarginate or subtruncate in front; prosternal process broad, the sides parallel to behind the coxal cavities, then strongly narrowed to the apex, which is acute. Tibiae slender, nearly straight, and the anterior and middle pairs armed with a short tooth on the inner margin at apex. Posterior tarsi nearly as long as the tibiae, and the first joint as long as the following joints united. Tarsal claws nearly similar on all feet, cleft near middle, teeth slender, the inner tooth slightly shorter than outer one, and feebly turned inward.

Length, 8.25 millimeters; width, 1.75 millimeters.

*Female*.—Differs from the male in being slightly more robust, head with the front cupreous, broader, and the lateral margins not strongly constricted at the bottom, prosternum and middle of body not clothed with long erect hairs, first and second abdominal segments convex, and without depressions or erect hairs at middle, tibiae unarmed at apex, and the inner tooth on the tarsal claws slightly shorter than those in the male.

Length, 9 millimeters; width, 2 millimeters.

*Type locality*.—Kedah Peak, Malay Peninsula.

*Other localities*.—Selangor, Kuala Lumpur, Federated Malay States.

*Type, allotype and paratype*.—United States National Museum.

*Paratypes*.—Selangor Museum, Kuala Lumpur, Federated Malay States.



This beautiful species is described from fourteen specimens. The type and allotype collected on Kedah Peak, Malay Peninsula at an elevation of 3,950 feet, on March 21 and 23, 1928, by H. M. Pendlebury, and twelve paratypes collected by Mr. Pendlebury, flying around and sitting upon a fallen tree in the Ampang Forest Reserve, about seven miles from Kuala Lumpur, on October 28, 1928.

The species is rather uniform in coloration, but in some of the specimens the elytra have a purplish tinge in spots, which is probably due to discoloration. Usually the golden yellow pubescent spot covers only the anterior half of the depression on the sides of the pronotum, but in a few of the examples it extends along the inside of the prehumeral carinae to the base of the pronotum. In the series examined the length varied from 7 to 9.5 millimeters.

This species is closely allied to *auripilis* described by Deyrolle from Borneo, but in that species the apical spine of the elytron is situated at the sutural angle, and the elytra have a narrow yellow pubescent vitta along the sutural margins.

***Coraebus semiviridis* sp. n.**

Large, robust, and moderately convex; head, pronotum, and scutellum bright green, with a distinct bluish tinge; elytra bronzy brown, with a strong violaceous tinge, especially toward the apex, the humeral regions extending from the scutellum obliquely backward to the lateral margin at middle bright green, and each elytron with a vague, oblique pubescent fascia; beneath bronzy brown at the sides, becoming green on the median parts.

Head in front slightly produced beyond the eyes, and broadly, longitudinally concave from occiput to epistoma; surface coarsely, more or less transversely rugose, except in bottom of concavity which is nearly smooth, coarsely punctate, and sparsely clothed with long, semierect white hairs, especially behind the epistoma.

Pronotum nearly two times as wide as long, slightly narrower in front than at base, and widest at middle; sides regularly, arcuately rounded, with the lateral margins strongly crenulate, and the posterior angles obtusely angulated; anterior margin feebly serrate, the median lobe slightly produced and angulated at middle; base strongly bisinuate, with the median lobe broadly rounded, and subtruncate in front of scutellum; disk strongly convex, with the sides strongly, broadly flattened, a large, deep, arcuate depression on each side extending from the lateral margin near middle to the base near median line, causing a round elevation in front of the elytral lobe, but without lateral carinae; surface very coarsely, irregularly, confluent rugose, coarsely, densely punctate between the rugae, and

sparsely clothed with short, inconspicuous hairs. Scutellum cordate, strongly depressed at middle, and the surface vaguely rugose.

Elytra as wide as pronotum at base, and about equal in width near base and just behind the middle; sides nearly parallel to apical third (feebly, arcuately constricted in front of middle), then arcuately narrowed to the tips, which are broadly rounded, and separately emarginate, with a large tooth near sutural angle; lateral margins finely crenulate to apical third, then dentate to the apical emargination; disk vaguely depressed along sutural margins, with deep, triangular basal depressions, and a narrow depression along lateral margins behind humeri; surface coarsely, densely rugose on the green areas and behind scutellum, coarsely, irregularly punctate on median parts, more or less imbricate toward the apex, sparsely clothed with inconspicuous black hairs, and each elytron ornamented with white pubescence as follows: A broad, vague, oblique fascia extending from the sutural margin at middle to the lateral margin at apical fourth, and with an area of similar hairs at apex.

Abdomen beneath densely imbricate at the sides, irregularly punctate at the middle, and densely clothed at the sides and apex with recumbent whitish hairs.

Length, 10.5 millimeters; width, 3.5 millimeters.

*Type locality*.—Peninsular Siam.

*Type*.—United States National Museum.

Described from a single specimen collected at Nakon Sri Tamarat, Khao Luang, 2,000 feet, Peninsular Siam, on March 24, 1922, by H. M. Pendlebury.

This species resembles *conjunctus* Deyrolle, but that species is much shorter, the pronotum is more finely rugose and with distinct lateral carinae, and the elytra have the tips broadly rounded and coarsely dentate, and the green basal areas extend obliquely inward to the sutural margins.

*Coraebus kedahae* sp. n.

Large, robust, and subparallel; head black; pronotum and elytra violaceous black, the former slightly pubescent at the sides, and the latter ornamented with white pubescent markings; beneath dark brown, with the median parts distinctly cupreous, and the sides of the mesosternum, metasternum, and first two abdominal segments densely clothed with orange yellow pubescence.

Head with the front rather deeply and broadly depressed behind the epistoma, and the depression rather densely clothed with moderately long, semierect white hairs, the vertex nearly flat, transversely rugose, and sparsely clothed with inconspicuous, long black hairs; antennae cupreous, and extending nearly to middle of pronotum.

Pronotum one-third wider than long at middle, slightly narrower at apex than base, and widest near middle; sides arcuately rounded, more strongly toward the apex, with the lateral margins finely crenulate, and the posterior angles obtusely angulated; anterior margin rather strongly sinuate, with the median lobe slightly produced and broadly rounded; base strongly bisinuate, with the median lobe strongly produced, and broadly truncate in front of scutellum; disk strongly convex, with the sides broadly depressed and sparsely clothed with moderately long, recumbent white hairs, and without lateral carinae; surface finely, sparsely punctate, and sparsely clothed with fine, inconspicuous hairs. Scutellum subcordate, strongly transverse, very acute posteriorly, and the surface sparsely punctate at middle.

Elytra as wide as pronotum at base, and about equal in width at base and behind middle; sides nearly parallel to behind middle (broadly, vaguely constricted in front of middle), then obliquely narrowed to the tips, which are broadly subtruncate, and the tip of each elytron armed with three teeth, one at the lateral margin, and two near the sutural margin, of which the sutural tooth is the smallest; disk slightly flattened, broadly, vaguely depressed along the sutural margins posteriorly, and with broad, shallow basal depressions; surface coarsely, densely imbricate-punctate, except behind the scutellum where it is nearly smooth, sparsely clothed with short, erect, inconspicuous hairs, and each elytron ornamented with white pubescent markings as follows: A few scattered hairs in the basal depression, a small spot near sutural margin at basal third, a similar spot near lateral margin at middle, a narrow, strongly sinuate fascia at apical third, and a narrow, oblique fascia near the apex.

Abdomen beneath rather densely, coarsely punctate on the median parts, finely punctate toward the sides, and striolate on the last segment; first and second segments broadly, densely clothed at the sides with recumbent orange yellow hairs and efflorescence; third, fourth and fifth segments sparsely clothed with rather long, recumbent, silvery white pubescence, which forms spots at the sides of the third and fourth segments; last segment longitudinally carinate at the middle. Prosternum sparsely, coarsely punctate, sparsely clothed with semierect hairs at the middle, but densely clothed at the sides with rather long, recumbent, cinereous pubescence and efflorescence. Legs dark brown, with a slight cupreous or aeneous reflection.

Length, 11 millimeters; width, 4 millimeters.

*Type locality.*—Kedah Peak, Malay Peninsula.

*Type.*—United States National Museum.

Described from a single example collected at the type locality at an elevation of 3,950 feet, on March 23, 1928, by H. M. Pendlebury.

This species is closely allied to *Coraeus hewitti* described by Kerremans from Borneo, but *hewitti* is more strongly narrowed posteriorly, the color above is black, with a distinct greenish tinge, the head is very deeply depressed in front, the elytra have a costa on each side, with the surface more deeply depressed along the sutural margins, and the pubescent markings are different, and the under side is not clothed with orange yellow pubescence.

***Toxoscelus speciosus* sp. n.**

Large, robust, and moderately convex; above uniformly velvety black, and the elytra with distinct silvery white pubescent markings; beneath black, the abdomen with a vague aeneous tinge, and the legs with a very vague purplish reflection.

Head with the front strongly convex, distinctly wider above than beneath, feebly gibbous on each side of the occiput, with a broad, transverse depression on the vertex and occiput, and a broad, longitudinal depression extending from it to a very deep, transverse groove behind the epistoma; surface coarsely but not strongly rugose, the rugae irregular, somewhat concentric on the gibbosities, and sparsely punctate between the rugae; antennae short, extending slightly beyond apical angles of pronotum, serrate from the fifth joint, the middle joints strongly transverse and prolonged on both sides; epistoma narrow between the antennae, and very deeply, triangularly emarginate in front; cheeks unarmed; antennal cavities large, and situated a certain distance from the inner margin of the eyes; eyes rather large and oblong.

Pronotum nearly two times as wide as long at middle, slightly wider at base than apex, and widest near middle; sides very strongly, arcuately expanded from apical angles to near the middle, where they are parallel to each other for a short distance, then strongly narrowed, and broadly, arcuately emarginate to the posterior angles, which are rectangular; anterior margin strongly, arcuately emarginate, with the median lobe strongly produced and broadly rounded; base transversely truncate to basal lobe of elytra, then extending obliquely backward to the scutellum, in front of which it is broadly subtruncate; lateral carina absent; disk very uneven, strongly convex at the middle anteriorly except for a broad, shallow depression behind the anterior margin, broadly depressed along the sides and base, where there are also a number of irregular obtuse elevations, and with a deep, concave depression on each side in front of posterior angle; surface coarsely, irregularly rugose, the rugae more or less concentric on the elevations, densely punctate between the rugae, sparsely clothed with

short, black hairs, and with a small spot of white hairs on each side of middle near base. Scutellum large, triangular, transversely elevated, and the surface coarsely punctate.

Elytra much wider than pronotum at base, slightly flattened on disk, and with broad, shallow basal depressions; humeral angles nearly rectangular; sides sinuate, nearly parallel to behind middle where they are strongly arcuately expanded, then obliquely narrowed to near the tips, which are broadly rounded, feebly serrate, and produced into a long, acute apical spine; surface very densely, finely punctate or granulose, rather densely clothed with inconspicuous black hairs, and each elytron ornamented with white pubescent markings as follows: Two small, irregular spots along base, a small arcuate spot along sutural margin near middle, a transverse fascia of six small, irregularly placed spots behind the middle, and a narrow biarcuate fascia extending obliquely backward from the lateral margin at apical fourth to near the sutural margin at apical sixth, and in front of which is a small arcuate spot close to the sutural margin.

Abdomen beneath densely marked with fine crenulate lines, rather densely, finely punctate, and without distinct pubescence; last segment sinuate at apex, the subapical margin smooth, sinuate, and strongly elevated, and the apical margin armed with six strong teeth. Prosternum coarsely rugose, and broadly, deeply emarginate in front, with a large tooth on each side of the emargination.

Length, 8.5 millimeters; width, 3.25 millimeters.

*Type locality*.—Selangor, Federated Malay States.

*Type*.—United States National Museum.

Described from a single specimen collected at Selangor, Bukit Kutu, 3,500 feet, on April 14, 1926, by H. M. Pendlebury.

This species is allied to *undatus* Deyrolle, but differs from it in having the antennae prolonged on both sides, pronotum without lateral carinae, and the different arrangement of the white pubescent designs on the elytra.

*Neotoxoscelus aeneiventris* sp. n.

Elongate, subparallel, and slightly convex; head and pronotum shining black, the former slightly aeneous behind the epistoma, and with two round bluish spots below the middle; elytra violaceous black, strongly shining, and ornamented with an oblique white pubescent design posteriorly; beneath aeneous, with the legs more or less violaceous.

Head with the front moderately convex, with a broad, longitudinal depression extending from the occiput to epistoma, and more deeply depressed on the vertex and occiput; surface coarsely, sparsely punctate, coarsely rugose, the rugae transverse on the front, but becoming irregular

on the vertex, and clothed with a transverse fascia of sparsely placed white hairs on the front; epistoma very narrow between the antennae, and subtruncate in front.

Pronotum nearly two times as wide as long, apex and base about equal in width, and widest just behind the middle; sides arcuately expanded from apical angles to just behind the middle, where they are obtusely angulated, then strongly, sinuately narrowed to the posterior angles, which are broadly rounded; anterior margin deeply emarginate, with a large, broadly rounded median lobe; base strongly bisinuate, with a broadly rounded lobe in front of scutellum; lateral carina short, arcuate, feebly elevated, situated at some distance from the margin, and extending from apical fourth to just behind the middle; surface strongly flattened toward the sides, densely, finely rugose, finely punctate on disk, the punctures and rugae becoming coarser toward the sides, and rather densely clothed with long, semierect black hairs on the median part, and with recumbent whitish hairs at the sides. Scutellum triangular, and the surface nearly smooth.

Elytra as wide at humeral angles as the pronotum at middle, and feebly flattened on disk; basal depressions very shallow; humeral angles broadly rounded; sides broadly, arcuately constricted in front of middle, broadly, arcuately expanded just behind the middle, then obliquely narrowed to the tips, which are produced into a long apical spine; surface finely, densely punctate, rather densely clothed with semierect black hairs, and each elytron ornamented with an oblique silvery white pubescent fascia, extending from the lateral margin just behind the middle obliquely backward to the sutural margin at apical fifth, the fascia becoming gradually broader internally, and partially enclosing a large dark area at the sutural margin.

Abdomen beneath strongly convex, densely marked with distinct transverse crenulate lines, finely punctate, and rather densely clothed with short, recumbent whitish hairs. Prosternum coarsely, densely rugose; prosternal lobe broadly subtruncate in front, with the margin vaguely elevated; prosternal process with the sides nearly parallel to behind the coxal cavities, then obliquely narrowed to the apex, which is obtusely rounded. Tarsi and tarsal claws black; tarsal lamellae brownish white.

Length, 6.75 millimeters; width, 2.5 millimeters.

*Type locality*.—Pahang, Federated Malay States.

*Type*.—United States National Museum.

Described from a single example collected at Pahang, Kuala Lipis, Bencha Forest Reserve, Federated Malay States, on May 28, 1926, by H. M. Pendlebury.

This species is allied to *bakeri* Fisher, and *luzonicus* Fisher, but is easily separated from both these species by

having the tips of the elytra produced into an acute apical spine, and also by the different arrangement of the white pubescent design on the elytra.

***Trachy kedahae* sp. n.**

Strongly elongate, moderately convex, slightly expanded anteriorly, and widest at base of elytra; head, pronotum, and elytra bluish or purplish black, with a distinct cupreous tinge, rather strongly shining, and irregularly clothed with golden yellow and yellowish white pubescence; beneath black, with a distinct aeneous reflection.

Head with the front deeply concave between the eyes, with a narrow median groove extending from the occiput to epistoma, and the two median postoral pores large and widely separated; surface sparsely, irregularly ocellate-punctate, and sparsely, irregularly clothed with rather long, recumbent yellowish hairs; eyes slightly margined on inner side, and strongly converging toward the bottom; epistoma transverse between the antennae, anterior margin transversely subtruncate, slightly elevated, and the surface densely reticulate; clypeal suture feebly indicated and slightly arcuate.

Pronotum three times as wide as long at middle, much narrower at apex than base, and widest at base; sides feebly arcuately narrowed from base to apical angles, which are acute, and extend forward on a line nearly with the front of the eyes; posterior angles produced slightly backward; anterior margin semicircularly emarginate; base strongly, transversely sinuate, with the median lobe broadly rounded, and moderately produced; surface slightly convex, feebly, broadly flattened toward the lateral margins, densely, finely ocellate-punctate, and sparsely, irregularly clothed with short, recumbent, golden yellow hairs. Scutellum small and triangular.

Elytra as wide as pronotum at base, and widest at base; sides rather strongly, arcuately narrowed from the base to the tips, which are conjointly, broadly rounded; humeri moderately prominent; each elytron with a distinct lateral carina extending from the humerus to near the apical margin, with a broad, shallow basal depression, and a similar depression along the lateral margin behind the humerus; surface sparsely, finely punctate, vaguely rugose in the basal region, and sparsely, irregularly clothed with recumbent golden yellow and yellowish white hairs intermixed, the hairs denser and more evenly distributed on the apical half.

Beneath strongly convex; abdomen vaguely granulose, densely, feebly ocellate-punctate, and very sparsely clothed with short, inconspicuous hairs toward the sides. Proster-num slightly declivous anteriorly, the anterior margin broadly subtruncate, and feebly emarginate at the middle;

prosternal process distinctly elevated, nearly two times as wide as long, about equal in width at base and apex, the sides feebly, arcuately rounded, and the surface coarsely ocellate-punctate. Tarsi and tarsal claws black; tarsal lamellae whitish.

Length, 2.8 millimeters; width, 1.75 millimeters.

*Type locality*.—Kedah Peak, Malay Peninsula.

*Type*.—United States National Museum.

*Paratype*.—Selangor Museum, Kuala Lumpur, Federated Malay States.

Described from two examples collected at the type locality at an elevation of 3,300 to 3,950 feet, on March 27, 1928, by H. M. Pendlebury.

This species is allied to *mindanaocensis* Fisher, described from the Philippine Islands, but *mindanaocensis* is more strongly attenuate posteriorly, the head and pronotum are of a dark bronzy color, the epistoma is much wider and very short between the antennae, and the prosternal process is distinctly narrower in front than behind.



#### IV. NEW BORNEAN BUPRESTIDAE.

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This paper is the result of a study of a collection of Buprestid Beetles received from C. Boden Kloss, Director of the Straits Settlements and Federated Malay States Museums. This collection contained many interesting species of the older writers, and also a number of new species, which are described in the present paper. The material was mostly collected in British North Borneo, in the vicinity of Sandakan, during 1927, by Messrs. C. Boden Kloss and H. M. Pendlebury.

My sincere thanks are extended to Mr. Kloss for the privilege of studying this interesting collection of Buprestidae, and also for his kindness in permitting me to deposit the types of the new species in the United States National Museum Collection.

*Iridotaenia sandakana*, sp. n.

Elongate, subparallel at middle, and moderately attenuate in front and behind; head ruby red in front, becoming bottle green on the occiput; mandibles green, except the tips which are black; pronotum and elytra uniformly bottle or aeneous green, with a purplish reflection in certain lights; beneath golden green, with a feeble cupreous tinge, and the legs slightly more bluish green.

Head with the front broadly, deeply depressed, the depression extending from epistoma to vertex, and laterally to near the eyes, and with a very deep, narrow, longitudinal groove in the middle of the depression; surface coarsely, sparsely, irregularly punctate, and clothed with a few short inconspicuous hairs; epistoma finely, densely granulose, with the anterior margin broadly, deeply, arcuately emarginate, and the lateral margins rugosely elevated.

Pronotum strongly transverse, and about equal in width at base and apex; sides strongly sinuate, nearly parallel, and vaguely constricted at apical and posterior angles; anterior margin slightly sinuate, with the median lobe vaguely produced and broadly rounded; base vaguely transversely sinuate; disk with a vague, narrow median groove extending from anterior margin to base, and with a narrow, irregular depression on each side near posterior angles extending from base forward to middle of pronotum; surface finely, densely granulose, irregularly punctate, the punctures fine and distinctly separated on the median part, but becoming coarser and confluent toward the sides. Scutellum small, elongate, broadly expanded behind, and the surface smooth.

Elytra slightly wider than pronotum at base; sides broadly rounded at humeral angles, nearly parallel to behind

the middle, then arcuately narrowed and strongly serrate to the tips, which are acutely rounded; disk slightly flattened along sutural margins near apex; surface rather densely, coarsely, irregularly punctate, more or less rugose in the basal region, but the punctures not forming distinct striae.

Abdomen beneath sparsely, coarsely and irregularly punctate at middle, finely, densely punctate or rugose toward the sides, where the surface is densely clothed with rather short, recumbent whitish hairs and efflorescence, which nearly conceals the surface; first segment vaguely gibbose between the posterior coxae; last segment broadly subtruncate or vaguely, arcuately emarginate at apex. Prosternal process nearly flat, and the surface with a few coarse scattered punctures.

Length, 22 millimeters; width, 7 millimeters.

*Type locality*.—Bettotan, North Borneo.

*Type*.—United States National Museum.

Described from a single specimen collected at the type locality, near Sandakan, July 27, 1927, by C. B. Kloss and H. M. Pendlebury.

This species is allied to *nitidiceps* Kerremans, described from Sumatra, but according to the description it differs from *nitidiceps* in having the pronotum and elytra uniformly bottle green with only a vague purplish tinge in certain lights, the elytra not coppery purple at the apex, and without a longitudinal depression along the sutural margins behind the middle.

***Iridotaenia acutipennis*, sp. n.**

Strongly elongate, navicular, and strongly attenuate in front and behind; head fiery red, with a slight aureous reflection on the occiput; mandibles aeneo-cupreous, with the tips black; pronotum and elytra bottle green, with the anterior margin of pronotum, a vague longitudinal median vitta on pronotum, and the sutural and lateral margins of elytra of a vaguely paler green color, and the pronotum and elytra ornamented on each side with a distinct, broad cupreous vitta, extending from the anterior margin of the pronotum to the apex of the elytra; beneath golden green, with a vague cupreous tinge.

Head with the front broadly, deeply, irregularly depressed, the depression extending from front of epistoma to vertex of head, and transversely interrupted behind the epistoma and at middle of front, and with a very deep, narrow, longitudinal groove in the middle of the depression, extending from epistoma to vertex; surface very coarsely, irregularly punctate, the punctures in some parts confluent, and without distinct pubescence; epistoma finely granulose and coarsely punctate, with the anterior margin broadly, deeply, arcuately emarginate, and the lateral margins acutely elevated.

Pronotum strongly transverse, and distinctly narrower at apex than base; sides sinuate and obliquely expanded from apex to base; anterior margin and base nearly transversely truncate or vaguely sinuate; disk with a narrow, longitudinal median groove, extending from anterior margin to base; surface sparsely, finely, irregularly punctate on the median green area, and coarsely, confluent punctate on the cupreous vittae. Scutellum small, elongate, vaguely expanded behind, and the surface smooth and feebly depressed.

Elytra slightly wider than pronotum at base; sides obtusely rounded at humeral angles, strongly sinuate for a short distance behind base, vaguely, arcuately narrowed to behind the middle, then strongly, obliquely narrowed and strongly serrate to the tips, which terminate in a sharp sutural spine; each elytron with a vague elongate depression along sutural margin behind middle, a rather broad, irregular basal depression, and with a few vague, narrow, longitudinal depressions along lateral margin behind middle; surface sparsely, irregularly punctate, the punctures very fine in the sutural region, but becoming coarser and more or less confluent toward the sides, but not forming distinct striae.

Abdomen beneath very finely, sparsely and irregularly punctate at the middle, densely, finely rugose and granulose toward the sides, where the surface is densely clothed with long, recumbent whitish pubescence and efflorescence, which nearly conceals the surface; first segment strongly convex between the posterior coxae; last segment broadly, but not very deeply, arcuately emarginate at apex. Prosternal process flat, and the surface with a few coarse scattered punctures.

Length, 26–29 millimeters; width, 7.5–8 millimeters.

*Type locality*.—Bettotan, North Borneo.

*Type*.—United States National Museum.

*Paratypes*.—Selangor Museum, Kuala Lumpur, Federated Malay States.

Described from three examples, all from the type locality, near Sandakan. The type was collected July 26, 1927, and the paratypes, July 12, 1927, by C. B. Kloss and H. M. Pendlebury.

This species is allied to *cyaniceps* Fabricius, but according to the description given by Kerremans, that species differs from *acutipennis* in having the head violaceous, pronotum elongate, elytra black, with the longitudinal vittae of a beautiful golden red color, and the prosternum with a yellow spot on each side.

*Exagistus brunneus*, sp. n.

Elongate, rather slender, slightly flattened above, and more strongly attenuate behind than in front; head purplish

red in front, but becoming dark brown on the occiput; pronotum dark brown on the median part, becoming broadly cupreous brown at the sides; elytra dark brown, with a vague greenish or purplish reflection in certain lights; beneath cupreous brown, and more strongly shining than above.

Head with the front very wide, flat, about equal in width at top and bottom, and without distinct depressions; surface coarsely, irregularly ocellate-punctate, the punctures slightly oblong and more or less confluent, and sparsely clothed with rather long, erect, inconspicuous hairs; epistoma very short, not separated from the front of head, and the anterior margin vaguely, arcuately emarginate; eyes small and broadly oblong; antennae extending to middle of pronotum, serrate from the fourth joint, the outer joints slightly longer than wide, and clothed with a few long hairs.

Pronotum nearly as wide as long, slightly narrower at apex than base, and widest at basal fourth; sides obliquely expanded from apical angles to basal fourth, where they are slightly arcuately expanded, then obliquely narrowed to the posterior angles; anterior margin transversely truncate or vaguely sinuate; base strongly arcuately emarginate at middle of each elytron, and the median lobe strongly produced and broadly rounded; disk strongly convex, with a very broad, shallow median depression extending from scutellum to near the anterior margin, and a vague, irregular depression on each side at middle near lateral margin; surface coarsely, densely, confluent punctate, especially at the sides, and sparsely clothed with a few inconspicuous hairs. Scutellum small, about as wide as long, truncate at base, broadly rounded at apex, and the surface smooth.

Elytra distinctly wider than pronotum at base; sides broadly rounded at humeral angles, nearly parallel to behind middle (vaguely constricted in front of middle), then obliquely narrowed to the tips, which are separately, obliquely emarginate, with the sutural tooth slightly longer than the lateral tooth; disk rather strongly flattened, sutural margins slightly elevated posteriorly, and with a few elongate, irregular depressions at base; surface punctate-striate, the striae feebly impressed, intervals vaguely convex, coarsely rugose, and finely, irregularly punctate, and sparsely clothed with short, inconspicuous hairs.

Abdomen beneath rather densely, coarsely punctate, the punctures open posteriorly, sparsely clothed with recumbent, yellowish pubescence, which forms denser spots at the sides of the segments; last segment broadly, transversely truncate or vaguely sinuate at apex, behind which is a transverse, semicircular smooth area. Prosternum

nearly flat, rather densely, coarsely punctate, sparsely pubescent, and without a prosternal lobe; prosternal process broad, the sides nearly parallel to behind the coxal cavities, then abruptly, arcuately constricted to the apex, which is narrowly rounded.

Length, 11–12 millimeters; width, 3.4–3.5 millimeters.

*Type locality*.—Sandakan, Borneo (Baker No. 12640).

*Other localities*.—Bettotan, North Borneo.

*Type*.—United States National Museum.

*Paratypes*.—Selangor Museum, Kuala Lumpur, Federated Malay States.

Described from two examples. The type was collected at Sandakan by C. F. Baker, and the paratype was collected at Bettotan, near Sandakan, August 20, 1927, by C. B. Kloss and H. M. Pendlebury.

This species is allied to *igniceps* Deyrolle, but that species differs from *brunneus* in having the pronotum uniformly convex, with only a vague median depression, the lateral margins more arcuately rounded, and the surface more densely punctured and with the sides fiery red, and the elytra and underside of body more densely punctured. It is also allied to *atroviridis* Fisher, but that species is more slender and parallel, more densely rugose and punctured, dark olivaceous green above, and the sides of the pronotum are nearly parallel.

*Phrixia opulenta*, sp. n. .

Elongate, subcylindrical, and slightly more attenuate behind than in front; head aureo-cupreous in front, but becoming violaceous blue on the occiput; pronotum violaceous blue, with a slight cupreous tinge, and becoming greenish toward the sides; elytra blue, with a vague violaceous reflection in certain lights, and greenish at the tips; beneath green, with a vague aureous reflection, and more strongly shining than above.

Head as wide as pronotum, nearly flat, vaguely, broadly depressed on the lower half, but not grooved on the occiput, the surface rather coarsely, densely, irregularly punctate in front, and becoming densely, longitudinally rugose on the vertex and occiput; epistoma not separated from the front of head, but deeply, subarcuately emarginate in front; antennae slender, and uniformly aeneous.

Pronotum strongly convex, nearly two-fifths wider than long, and about equal in width at base and apex, sides nearly parallel from apical angles to basal fourth, then vaguely narrowed to the posterior angles, and without marginal carinae, except at basal third; anterior margin transversely truncate; base broadly, arcuately emarginate at middle of each elytron, then broadly, arcuately expanded to the scutellum; disk uniformly convex, with a small, vague

fovea in front of scutellum; surface vaguely, transversely rugose at middle, rather densely, irregularly punctate, the punctures fine and sparse on the median part, but becoming coarser, deeper, and more or less confluent at the sides. Scutellum small, rounded, and the surface smooth.

Elytra slightly wider than pronotum; sides nearly parallel and strongly sinuate to behind the middle, where they are vaguely, broadly expanded, then obliquely narrowed to the tips, which are separately, arcuately emarginate, with the two spines subequal in length; surface finely punctate-striate, the striae feebly impressed on the disk, but becoming more or less confused toward the sides; intervals flat, smooth, and irregularly punctate.

Beneath rather densely, irregularly punctate, the punctures deep, open posteriorly, fine on the median part, but becoming coarser toward the sides, and very sparsely clothed with long, fine, semierect hairs; last abdominal segment broadly rounded or subtruncate at apex.

Length, 14 millimeters; width, 4 millimeters.

*Type locality*.—Gunong Tamabo, Baram River, Sarawak, Borneo.

*Type*.—United States National Museum.

Described from a single specimen collected at the type locality, November 5, 1920, by J. C. Moulton.

This species is closely allied to *cuprina* described by Kerremans from Sarawak, which has not been examined by the writer. From the description *cuprina* differs from *opulenta* in having the upper surface uniformly coppery purple, except the scutellum and anterior margin of pronotum, which are green, the pronotum nearly square, with the anterior margin arcuately expanded, the sides obliquely narrowed in front and behind, with a distinct fovea in front of the scutellum, the surface transversely rugose, and the surface of the elytra is finely granulose.

*Neotoxcelus ornatus*, sp. n.

Elongate, subparallel, and moderately convex; above black, with a violaceous tinge, especially on the head and pronotum, rather strongly shining, and the elytra ornamented with distinct white pubescent designs; beneath black, with a vague brownish or aeneous reflection, and slightly more shining than above.

Head with the front rather strongly convex, much wider at top than bottom, with a narrow, longitudinal groove behind the epistoma, and broadly, but not very deeply concave on the occiput and vertex, causing the sides to be slightly gibbose; surface finely, but not closely striolate, the striae sparsely punctate, concentric on the gibbosities, but becoming transverse and irregular on the front, and sparsely clothed with short white hairs behind the epistoma; epistoma narrow between the antennae,

broadly expanded in front of the antennae, and the anterior margin transversely truncate; eyes large, and strongly converging toward the bottom on the inner sides.

Pronotum three-fifths wider than long, about equal in width at base and apex, and widest at middle; sides with the margin coarsely crenulate, strongly arcuately rounded from the apical angles to just behind the middle, then strongly, obliquely narrowed to the posterior angles, which are obtusely rounded; anterior margin rather deeply emarginate, with a feebly produced, broadly rounded median lobe; base very strongly bisinuate, with the median lobe strongly produced, and vaguely, arcuately emarginate in front of the scutellum; disk strongly elevated on the antero-median part, slightly gibbose on each side, deeply, narrowly concave along the base, broadly flattened at the sides, and with a strongly elevated lateral carina on each side, extending from the posterior angle to apical third of pronotum; surface coarsely, irregularly striolate, the striae becoming concentric on the median part, finely, sparsely punctate in the striae, and sparsely, irregularly clothed with short white hairs, with a few inconspicuous dark hairs intermixed. Scutellum strongly transverse, very acute posteriorly, and the surface vaguely reticulate.

Elytra distinctly narrower at base than at middle of pronotum, and slightly wider behind middle than at base; humeral angles obtusely angulated; sides feebly rounded behind the humeral angles, broadly arcuately constricted in front of middle, broadly expanded behind the middle, then obliquely narrowed to the tips, which are separately, broadly, obliquely truncate, and vaguely sinuate; disk slightly convex, and with broad, rather shallow basal depressions; surface coarsely, densely rugose on the basal half, rather densely punctate, the punctures coarse on the basal half, but becoming finer toward the apex, sparsely clothed with short, inconspicuous dark hairs, and each elytron ornamented with white pubescence as follows: A few scattered hairs along the sutural margin behind the scutellum, a narrow, transverse fascia at middle, scarcely extending to the lateral margin, angularly expanded at the sutural margin, and partially enclosing a small, triangular dark area at the sutural margin, and a broad, transverse fascia at apical third, enclosing a small dark area near the sutural margin.

Abdomen beneath strongly convex, finely, sparsely punctate, finely marked with irregular crenulate lines, which are more deeply impressed and concentric on the basal segment, and sparsely clothed on the median part with recumbent scale-like whitish hairs; last segment very broadly truncate, and more or less sinuate at apex. Prosternum broadly, deeply concave at the lateral margins, and the surface coarsely striolate, with a few punctures in the

striae; prosternal lobe short and bilobed; prosternal process arcuately elevated, very strongly narrowed to the apex, which is acute, and the surface coarsely rugose, and clothed with a few short, semierect hairs. Tarsi and tarsal claws black; tarsal lamellae brownish white.

Length, 4.5 millimeters; width, 1.5 millimeters.

*Type locality*.—Samawang, North Borneo.

*Type*.—United States National Museum.

Described from a single example collected at the type locality, near Sandakan, July 15, 1927, by C. B. Kloss and H. M. Pendlebury.

This species is allied to *luzonicus* Fisher, but differs from it in many ways, of which the following are the most important: Pronotum deeply concave along the base, broadly flattened toward the lateral margins, which are coarsely crenulate, the disk bigibbose on the antero-median part, and with long lateral carinae; elytra with the tips obliquely truncate, and a different arrangement of the white pubescent designs; prosternum deeply concave along the lateral margins, and with the prosternal lobe distinctly bilobed.

*Melibaeus melanescens*, sp. n.

Very small and slender, moderately convex, and strongly attenuate posteriorly; head aeneo-cupreous in front, becoming purplish black on the occiput; pronotum and elytra black, with a distinct purplish and greenish tinge in certain lights; beneath aeneous, with a slight cupreous reflection, and strongly shining.

Head with the front broad, strongly convex, about equal in width at top and bottom, the sides vaguely arcuately constricted, and without gibbosities or depressions; surface coarsely, irregularly rugose, finely, sparsely punctate between the rugae, and clothed with a few scattered white hairs behind the epistoma; epistoma rather narrow between the antennae, strongly, transversely carinate, and the anterior margin very broadly, but not deeply, subangularly emarginate.

Pronotum two-thirds wider than long, narrower at apex than base, and widest just in front of middle; sides vaguely margined and crenulate, slightly sinuate, feebly rounded from posterior angles to apical fourth, then strongly arcuately narrowed to the apical angles, which are acute; posterior angles obtusely rounded; anterior margin feebly, arcuately emarginate, with the median lobe slightly produced and broadly rounded; base strongly bisinuate, with the median lobe strongly produced, and transversely truncate in front of scutellum; disk broadly gibbose on the antero-median part, and broadly, irregularly concave along the base and lateral margins; surface coarsely, but not deeply, irregularly rugose, finely sparsely punctate, the punctures connected posteriorly to the rugae, and



sparsely clothed toward the sides with short, inconspicuous white hairs; intervals smooth. Scutellum triangular, very acute posteriorly, and the surface vaguely reticulate.

Elytra slightly wider than pronotum at base, rather strongly convex, and slightly wider at base than behind middle; humeral angles obtusely rounded; sides broadly rounded behind the base, broadly arcuately constricted in front of middle, then obliquely narrowed to the tips, which are separately broadly rounded, and feebly serrate; surface finely, irregularly transversely rugose, the rugae coarser in basal region, sparsely, coarsely punctate, the punctures connected posteriorly to the rugae, and sparsely clothed with short, inconspicuous hairs.

Abdomen beneath strongly convex, finely, sparsely punctate, finely marked with irregular crenulate lines, which are coarser on the basal segment, and sparsely clothed with short, inconspicuous white hairs; last segment broadly rounded and vaguely emarginate at apex, and sparsely clothed with long, erect white hairs along the apical margin; pygidium with a strongly elevated longitudinal carina, which is obtusely produced at apex. Prosternum coarsely rugose, and sparsely clothed with erect white hairs; prosternal process with the sides parallel to behind the coxal cavities, then obliquely narrowed to the apex, which is acute. Tarsi and tarsal claws black; tarsal lamellae brownish white.

Length, 3.5 millimeters; width, 1.3 millimeters.

*Type locality*.—Saniawang, North Borneo.

*Type*.—United States National Museum.

*Paratype*.—Selangor Museum, Kuala Lumpur, Federated Malay States.

Described from two examples collected at the type locality, near Sandakan, July 12 and 15, 1927, by C. B. Kloss and H. M. Pendlebury.

This species is allied to *exiguus* Fisher, but differs from it in having the upper surface black with a distinct greenish and purplish tinge, the head is coarsely rugose, and the pronotum is more strongly flattened toward the sides, with the lateral margins more parallel.

*Coraebus rajah*, sp. n.

Short, moderately convex, bright green above and beneath, and the elytra ornamented with a large oblong cupreous brown spot on the middle of each elytron at basal fourth, a large diamond shaped spot of the same color extending from basal third to apical fourth and common to both elytra, with the exterior angles of the spot slightly produced outward, but not reaching the lateral margins.

Head scarcely produced in front beyond the eyes, with the front broad, slightly wider at top than bottom, a broad

concave depression extending from vertex to epistoma, more deeply depressed toward the epistoma, and the lateral margins vaguely, obliquely converging toward the bottom; surface coarsely, deeply, and more or less transversely rugose, sparsely, coarsely punctate between the rugae, and glabrous; epistoma not transverse between the antennae, depressed at the clypeal suture, and deeply, arcuately emarginate in front; antennae extending to middle of pronotum, serrate from the fourth joint, and the outer joints distinctly wider than long; eyes rather large, and broadly oblong.

Pronotum more than two times as wide as long, narrower at apex than base, and widest at middle; sides arcuately rounded, and finely crenulate; anterior margin strongly sinuate, with the median lobe moderately produced and broadly rounded; base strongly, arcuately emarginate at middle of each elytron, with the median lobe slightly produced, and broadly subtruncate in front of scutellum; disk broadly concave on basal half, more deeply toward the sides, which are broadly flattened, and with strongly elevated, straight prehumeral carinae extending from posterior angles forward to the anterior margin; surface coarsely, deeply and irregularly rugose, the rugae more or less concentric on the antero-median part, and sparsely, coarsely punctate between the rugae. Scutellum cordate, and the surface finely reticulate, with a few coarse punctures intermixed.

Elytra about as wide as pronotum at base; sides nearly parallel to apical third (vaguely constricted near middle), then strongly, arcuately narrowed to the tips, which are conjointly broadly rounded, and densely, coarsely serrate; disk strongly convex, with broad, very shallow basal depressions, and a similar depression along the lateral margin behind humerus; surface coarsely, densely, transversely rugose or scabrous, coarsely, densely punctate, and sparsely clothed with short, recumbent, inconspicuous hairs.

Abdomen beneath marked with irregular lines, which are denser at the sides of first segment, finely, sparsely punctate, and vaguely clothed with short inconspicuous hairs. Prosternum very deeply depressed at the sides, the sharply produced lateral margins causing the antennae while at rest to be invisible from above, but the surface is not grooved for the insertion of the antennae while at rest; prosternal lobe very narrow at middle, very deeply, arcuately emarginate, and forming a large lobe on each side. Tarsal claws deeply cleft, and the teeth equal in length.

Length, 6.5 millimeters; width, 3 millimeters.

*Type locality*.—Bettotan, North Borneo.

*Type*.—United States National Museum.

Described from a single example (sex undetermined), collected at the type locality, near Sandakan, August 7, 1927, by C. B. Kloss and H. M. Pendlebury.

This species can be separated from the other species of *Coraebus* described from this region by the light green color above and the elytra ornamented with a large coppery brown diamond shaped spot. It is not quite typical of the genus, as the prosternum has a very narrow prosternal lobe in front, which is strongly lobed on each side of the middle, and the sides of the prosternum are very deeply concave, caused by the sharply produced lateral margins, which conceal the antennae from above while at rest, but the surface is not grooved for the insertion of the antennae.

*Agrilus samawangensis*, sp. n.

*Male*.—Moderately large, elongate, and strongly attenuate posteriorly; head aureo-aeneous in front, but becoming more greenish on the occiput; pronotum green, with a distinct aureous tinge; elytra aureo-viridis on basal half, becoming purplish black on the apical half, and ornamented with more or less distinct white pubescent designs; beneath aeneous, more strongly shining than above, and with a vague cupreous tinge on the legs.

Head in front narrow, nearly flat, wider at bottom than top, with a shallow longitudinal depression on the vertex, a similar vague depression behind the epistoma, and the lateral margins strongly constricted at occiput, broadly arcuately expanded at vertex, and vaguely arcuately constricted in front; surface rather coarsely granulose, coarsely, irregularly transversely rugose, sparsely, irregularly punctate between the rugae, and clothed with a few erect white hairs along the lateral margins and behind the epistoma; epistoma slightly transverse between the antennae, broadly, arcuately emarginate in front, and the clypeal suture distinct; antennae extending to middle of pronotum, serrate from the fourth joint, and the outer joints longer than wide; eyes large, broadly oblong, and about equally rounded above and beneath.

Pronotum about two-fifths wider than long, about equal in width at base and apex, and widest at middle; sides feebly arcuately rounded; when viewed from the side the marginal carina is slightly sinuate, the submarginal carina more strongly sinuate, the two carinae rather widely separated anteriorly, and connected to each other behind the middle; anterior margin strongly sinuate, with the median lobe strongly produced and broadly rounded; base strongly angularly emarginate at middle of each elytron, with the median lobe broadly rounded, and vaguely emarginate in front of scutellum; disk broadly concave along basal half, the concavity extending obliquely forward on each side to apical third, and with short, straight prehumeral carinae, which do not extend to base or lateral

margins; surface coarsely, densely scabrous. Scutellum strongly, transversely carinate, and the surface finely, densely reticulate.

Elytra slightly wider than pronotum at base, and slightly wider at base than behind middle; sides rather broadly expanded behind base, broadly, arcuately constricted in front of middle, broadly arcuately expanded behind middle, then obliquely narrowed to the tips, which have a large, long tooth at the middle, and a much shorter tooth at the lateral margins; disk slightly flattened, and with broad, deep basal depressions; surface densely, coarsely granulose on basal half, finely punctate posteriorly, rather densely clothed with long, inconspicuous recumbent hairs, and each elytron ornamented with white pubescence as follows: a more or less distinct irregular spot at middle, and a similar spot covering the apical sixth.

Abdomen beneath finely, densely punctate, the punctures becoming sparser toward apex, and sparsely, irregularly clothed with long, recumbent whitish hairs; intervals smooth; first segment vaguely flattened at middle; last segment subtruncate at apex, with the marginal groove deep, extending to anterior margin of segment, and arcuately emarginate at apex; vertical portions of segments not conspicuously pubescent; sides scarcely visible from above; pygidium strongly longitudinally carinate, and the apex produced into a large acute spine. Prosternum finely, densely punctate, and densely clothed at middle with long, erect white hairs, which extend along middle of body to first abdominal segment; prosternal lobe broad, slightly declivous, and broadly, vaguely emarginate in front; prosternal process rather broad, the sides parallel to behind the coxal cavities, then abruptly narrowed to the apex, which is acute. Tibiae slender, the anterior pair slightly arcuate, and the anterior and middle pairs armed with a short tooth on inner margin at apex. Posterior tarsi nearly as long as the tibiae, and the first joint as long as the following joints united. Tarsal claws dissimilar, anterior and middle claws cleft near the tip, and the teeth nearly equal in length, but the inner one not turned inward; posterior claws cleft near the middle, and the inner tooth much shorter than the outer one.

Length, 7-7.5 millimeters; width, 1.6-1.75 millimeters.

*Type locality*.—Samawang, North Borneo.

*Type*.—United States National Museum.

*Paratype*.—Selangor Museum, Kuala Lumpur, Federated Malay States.

Described from two males collected at the type locality, near Sandakan, July 12, 1927, by C. B. Kloss and H. M. Pendlebury.

This species is allied to *pictithorax* Obenberger, but differs from that species in being larger, the front of the

head narrower and coarsely rugose, pronotum more uniformly green, equal in width at the base and apex, and the sides regularly rounded, the pygidium acutely produced at the apex, the prosternal lobe emarginate in front, and the first abdominal segment only vaguely flattened at the middle.

*Agrilus abreu*, sp. n.

*Female*.—Elongate, rather robust, and moderately attenuate posteriorly; head dark green; pronotum aureo-viridis, with a distinct cupreous tinge on median part; elytra green on basal fifth, dark violaceous blue posteriorly, and each elytron ornamented with a narrow white pubescent vitta along sutural margin behind middle; beneath aeneo-viridis, with a vague cupreous reflection.

Head with the front moderately wide, slightly convex, about equal in width at top and bottom, with a rather broad, longitudinal depression extending from epistoma to occiput, the depression deeper on the vertex, and the lateral margins nearly parallel; surface densely, coarsely, irregularly rugose, sparsely punctate between the rugae, and sparsely clothed with long, recumbent yellowish hairs behind the epistoma, and with inconspicuous blackish hairs on the vertex and occiput; epistoma slightly transverse between the antennae, strongly elevated, transversely truncate in front, and the clypeal suture not very distinct; antennae short, extending to near middle of pronotum, serrate from the fourth joint, and the outer joints about as long as wide; eyes large, broadly oblong, and more acutely rounded beneath than above.

Pronotum nearly two times as wide as long, about equal in width at base and apex, and widest at middle; sides rather strongly arcuately rounded, and vaguely sinuate near posterior angles; when viewed from the side the marginal carina is strongly sinuate, the submarginal carina nearly straight, the two carinae rather widely separated anteriorly, and connected to each other behind the middle; anterior margin strongly sinuate, with the median lobe moderately produced and broadly rounded; base strongly, angularly emarginate at middle of each elytron, with the median lobe broadly, transversely truncate in front of scutellum; disk broadly, deeply concave in front of scutellum, the depression shallower on each side and extending obliquely forward to the apical third, and with long, strongly elevated, arcuate prehumeral carinae, which extend from base near posterior angles forward to middle, but not connected to the lateral margins; surface coarsely, densely rugose or scabrous, the rugae strongly elevated, more or less transverse and interrupted at the middle, and finely, sparsely punctate between the rugae. Scutellum strongly, transversely carinate, and the surface somewhat rugose.

Elytra slightly wider than pronotum at base, and about equal in width at base and behind middle; sides vaguely expanded behind base, broadly arcuately constricted in front of middle, arcuately expanded behind middle, then arcuately narrowed to the tips, which are conjointly rounded, with a more or less distinct short sutural tooth, and the margins vaguely serrate; disk vaguely flattened, and with rather deep, broad basal depressions; surface densely, coarsely imbricate-punctate, rather densely clothed with short, semierect, inconspicuous hairs, and each elytron ornamented with a white pubescent vitta along the sutural margin, extending from middle to near the apex.

Abdomen beneath densely marked with more or less transverse crenulate lines, which are coarser on basal segment, rather densely, finely punctate, rather densely, uniformly clothed with long white hairs, which are recumbent on basal segments and erect on the apical segment; first segment strongly convex at middle; last segment rather acutely rounded at apex, with the marginal groove deep, extending to anterior margin of segment, and deeply, arcuately emarginate at apex; vertical portions of segments not conspicuously pubescent; sides scarcely visible from above; pygidium rounded at apex, and without a projecting carina. Prosternum densely, coarsely rugose, and rather densely clothed with short, semierect white hairs; prosternal lobe broad, strongly declivous, and broadly, arcuately emarginate in front; prosternal process broad, the sides strongly expanded behind the coxal cavities, with the apex broadly, transversely biemarginate, and the median tooth longer and acute. Tibiae slender, straight, and unarmed at apex. Posterior tarsi very short, about one-fourth as long as the tibiae, and the first joint as long as the following two joints united. Tarsal claws similar on all feet, cleft near middle, the inner tooth much shorter and broader than outer one, and not turned inward.

Length, 6.25 millimeters; width, 1.75 millimeters.

*Type locality*.—Bettotan, North Borneo.

*Type*.—United States National Museum.

Described from a unique female collected at the type locality, near Sandakan, August 21, 1927, by C. B. Kloss and H. M. Pendlebury.

This species is allied to *xenius* Obenberger, but differs from that species in color, the head is narrower and the epistoma not transverse between the antennae, pronotum deeply depressed in front of the scutellum, prehumeral carinae strongly arcuate and not connected to the lateral margins, and the white pubescence on the elytra forming vittae instead of spots.

The species is named in honor of Antonio d'Abreu, who sailed along the southern coast of Borneo in 1511, and was probably one of the first white men to visit this island.

*Agrilus convergens*, sp. n.

*Female*.—Small, slender, and moderately attenuate posteriorly; head aeneous behind epistoma, but becoming greenish black posteriorly; pronotum greenish blue, becoming narrowly aeneous at the sides; elytra aeneo-cupreous at base, becoming purplish posteriorly, and each elytron ornamented with a broad white pubescent vitta, extending from basal depression to apex; beneath aeneous, with a vague cupreous tinge.

Head with the front rather wide, nearly flat, about equal in width at top and bottom, with a shallow longitudinal depression on the vertex, and the lateral margins vaguely expanded at the vertex; surface densely, coarsely granulose, rather coarsely, irregularly rugose, the rugae widely separated, and more or less transverse on the front, sparsely, finely punctate between the rugae, and clothed with a few erect white hairs along the lateral margins and behind the epistoma; epistoma slightly transverse between the antennae, subtruncate in front, and the clypeal suture distinct; antennae extending to basal fourth of pronotum, serrate from the fourth joint, and the outer joints about as wide as long; eyes large, rather broadly oblong, and about equally rounded beneath and above.

Pronotum about two-fifths wider than long, slightly wider at apex than base, and widest along apical third; sides feebly arcuately expanded from apical angles to middle, then obliquely narrowed to the posterior angles, which are nearly rectangular; when viewed from the side the marginal carina is strongly sinuate, the submarginal carina nearly straight, the two carinae widely separated anteriorly, and connected to each other at the base; anterior margin strongly sinuate, with the median lobe strongly produced, and broadly rounded; base strongly, angularly emarginate at the middle of each elytron, with the median lobe broadly subtruncate in front of the scutellum; disk broadly, but not deeply, concave along basal half, the concavity extending obliquely forward on each side to the apical third, and with short, distinct, arcuate prehumeral carinae, which extend from the posterior angles forward to the lateral margins near middle; surface coarsely, densely rugose, the rugae strongly elevated, and more or less transverse at the middle, and sparsely, finely punctate between the rugae. Scutellum strongly, transversely carinate, and the surface finely, densely reticulate.

Elytra slightly wider than pronotum at base, and about equal in width at base and behind middle; sides nearly parallel from humeral angles to behind middle (vaguely constricted in front of middle), then obliquely narrowed

to the tips, which are bispinose, with the sutural spine distinctly longer than the lateral one; disk vaguely flattened, sutural margins slightly elevated behind middle, and with broad, deep basal depressions; surface densely, coarsely imbricate-punctate, and each elytron ornamented with a pubescent vitta, composed of uniformly distributed, short, semierect white hairs, the vitta covering the sutural half, and extending from base to apex,

Abdomen beneath vaguely granulose, rather densely finely punctate, rather densely marked with transverse crenulate lines, which are coarser on basal segment, and rather densely, uniformly clothed with short, recumbent white hairs; first segment strongly convex at middle; last segment subtruncate or broadly rounded at apex; vertical portions of segments not conspicuously pubescent; sides rather broadly exposed above; pygidium angularly produced at apex, but not carinate. Prosternum coarsely, sparsely punctate, and sparsely clothed with short, recumbent white hairs; prosternal lobe broad, moderately declivous, and broadly, vaguely emarginate in front; prosternal process broad, the sides parallel to behind the coxal cavities, then abruptly narrowed to the apex, which is acute. Tibiae slender, straight, and unarmed at apex. Posterior tarsi about one-half as long as the tibiae, and the first joint as long as the following three joints united. Tarsal claws similar on all feet, cleft near the middle, the inner tooth much shorter than outer one, and not turned inward.

Length, 5.25 millimeters; width, 1.3 millimeters.

*Type locality*.—Samawang, North Borneo.

*Type*.—United States National Museum.

Described from a single female collected at the type locality, near Sandakan, July 15, 1927, by C. B. Kloss and H. M. Pendlebury.

This species is very closely allied to *insularis* Deyrolle, but it differs from that species in having the pubescent vittae on the elytra entire, and the vittae not interrupted by a transverse dark area at apical third as in *insularis*.

*Agrilus brooksi*, sp. n.

*Female*.—Small, slender, and moderately attenuate posteriorly; head aeneous in front, becoming more greenish on the vertex and occiput; pronotum and elytra uniformly dark green, rather strongly shining, and the latter with a vague purplish reflection toward the apex only seen in certain lights; beneath aeneo-viridis, with a vague cupreous tinge, and more strongly shining than above.

Head with the front rather wide, feebly convex, about equal in width at top and bottom, with a vague, narrow, longitudinal groove on the occiput and vertex, and the lateral margins broadly, arcuately expanded at vertex;



surface vaguely granulose, finely, transversely, irregularly, but not closely, rugose, sparsely, finely punctate between the rugae, and sparsely clothed with very short white hairs behind the epistoma; epistoma strongly transverse between the antennae, broadly, arcuately emarginate in front, and the clypeal suture distinct; antennae short, extending to anterior margin of pronotum, serrate from the fourth joint, and the outer joints strongly transverse; eyes narrowly oblong, and about equally rounded beneath and above.

Pronotum nearly two times as wide as long, slightly wider at apex than base, and widest at apical third; sides feebly, arcuately expanded from apical angles to middle, then obliquely narrowed to the posterior angles, which are nearly rectangular; when viewed from the side the marginal carina is nearly straight, the submarginal carina slightly sinuate, the two carinae rather widely separated anteriorly, and connected to each other near the base; anterior margin slightly sinuate, the median lobe vaguely produced, and broadly rounded; base strongly angularly emarginate at middle of each elytron, with the median lobe broadly, vaguely emarginate in front of scutellum; disk uniformly convex, and without distinct depressions or prehumeral carinae; surface finely, closely, strongly, transversely rugose, and finely, sparsely punctate between the rugae. Scutellum strongly, transversely carinate, and the surface densely, finely reticulate.

Elytra slightly wider than pronotum at base, and about equal in width at base and behind middle; sides slightly expanded behind base, broadly, arcuately constricted in front of middle, broadly arcuately expanded behind middle, then obliquely narrowed to the tips, which are separately, rather narrowly rounded, and strongly serrate; disk vaguely flattened, sutural margins slightly elevated behind middle, and with broad, rather deep basal depressions; surface finely, densely imbricate-punctate, and sparsely clothed with very short, inconspicuous brownish hairs.

Abdomen beneath vaguely granulose, finely marked with transverse crenulate lines, finely, rather densely, uniformly punctate, and rather densely, uniformly clothed with short, recumbent hairs; first segment convex at middle; vertical portions of segments not conspicuously pubescent; sides broadly exposed above; pygidium without a projecting carina at apex. Prosternum sparsely, coarsely scabrous, and sparsely clothed with short, erect white hairs; prosternal lobe broad, moderately declivous, and broadly subtruncate in front; prosternal process rather narrow, and the sides vaguely narrowed to the apex, which is acute. Tibiae slender, nearly straight, and unarmed at apex. Posterior tarsi about one-half as long as the tibiae, and the first joint as long as the following three joints united,

Tarsal claws similar on all feet, cleft near middle, the inner tooth much shorter than outer one, and not turned inward.

Length, 4.75 millimeters; width, 1.25 millimeters.

*Type locality*.—Samawang, North Borneo.

*Type*.—United States National Museum.

Described from a single female collected at the type locality, near Sandakan, July 15, 1927, by C. B. Kloss and H. M. Pendlebury.

This species is allied to *fisheri* Obenberger, but that species differs from *brooksi* in being more strongly attenuate posteriorly, the tips of the elytra acute, and each elytron is ornamented with a distinct narrow vitta of golden yellow pubescence extending from the basal depression to the apex.

*Agrilus contractus*, sp. n.

*Female*.—Rather small, slender, and moderately attenuate posteriorly, head aureous, with a distinct cupreous or reddish tinge in front, but becoming olivaceous on the occiput; pronotum brownish cupreous, with a distinct purplish tinge in some parts, and aureous between the marginal and submarginal carinae; elytra aeneo-cupreous on basal two-thirds, more greenish along sutural margins, becoming purplish on apical third, and ornamented with pubescent designs, beneath aureo-aeneous, with a slight cupreous tinge, and more strongly shining than above.

Head with the front narrow, nearly flat, slightly wider at bottom than at top, with a vague longitudinal depression on the front, more distinctly depressed on the vertex and occiput, and the lateral margins vaguely expanded at vertex; surface densely, finely granulose, sparsely, coarsely punctate, coarsely rugose, the rugae transverse behind the epistoma and longitudinal on the occiput, and clothed with a few long white hairs along the lateral margins and behind the epistoma; epistoma slightly transverse between the antennae, transversely subtruncate in front, and the clypeal suture distinct; antennae extending to basal fourth of pronotum, serrate from the fourth joint, and the outer joints vaguely longer than wide; eyes large, broadly oblong, and about equally rounded beneath and above.

Pronotum one-fourth wider than long, vaguely wider at apex than base, and widest along apical half; sides feebly narrowed at apical angles, nearly parallel to middle, then strongly narrowed to the posterior angles, which are rectangular; when viewed from the side the marginal carina is strongly sinuate, the submarginal carina nearly straight, the two carinae rather widely separated anteriorly, and connected to each other at the base; anterior margin strongly sinuate, with the median lobe strongly produced and broadly rounded; base arcuately emarginate at middle of each elytron, with the median lobe broadly subtruncate

in front of scutellum; disk deeply, broadly concave along basal half, the concavity extending obliquely forward on each side to apical third, and with short, distinct, arcuate prehumeral carinae, which extend from the posterior angles forward to the lateral margins at middle; surface coarsely, densely rugose or scabrous. Scutellum strongly, transversely carinate, and the surface finely, densely reticulate.

Elytra slightly wider than pronotum at base, and about equal in width at base and behind middle; sides slightly sinuate and vaguely expanded behind base, broadly arcuately constricted in front of middle, broadly arcuately expanded behind middle, then obliquely narrowed to the tips, which are vaguely emarginate and irregularly serrate; disk vaguely depressed along the sutural margins, which are rather strongly elevated posteriorly, and with broad, deep basal depressions; surface coarsely, densely imbricate-punctate, rather densely clothed with short, inconspicuous hairs, and each elytron ornamented with whitish pubescence as follows: a broad vitta covering the sutural half and extending from base to middle, then broadly expanded externally to the lateral margin, and a spot covering the apical sixth.

Abdomen beneath vaguely granulose, densely marked with more or less transverse crenulate lines, finely, sparsely punctate, and rather densely, uniformly clothed with long, recumbent white hairs; first segment strongly convex at middle; last segment broadly rounded at apex; vertical portions of segments not conspicuously pubescent; sides broadly exposed above; pygidium acutely, angularly produced at apex, longitudinally carinate, but the carina not projecting. Prosternum densely, coarsely scabrous, and sparsely clothed with short, inconspicuous hairs; prosternal lobe broad, rather strongly declivous, and broadly rounded in front; prosternal process broad, the sides parallel to behind the coxal cavities, then abruptly narrowed to the apex, which is acute. Tibiae slender, straight, and unarmed at apex. Posterior tarsi two-thirds as long as the tibiae, and the first joint as long as the following three joints united. Tarsal claws similar on anterior and middle feet, cleft near the middle, the inner tooth much shorter than outer one, and not turned inward. (Claws on posterior feet missing).

Length, 5.75 millimeters; width, 1.5 millimeters.

*Type locality*.—Samawang, North Borneo.

*Type*.—United States National Museum.

Described from a single female collected at the type locality, near Sandakan, July 12, 1927, by C. B. Kloss and H. M. Pendlebury.

This species is allied to *albogaster* Deyrolle, but differs from that species in having the pronotum more coarsely

rugose, deeply concave along the basal half, and the prehumeral carinae are shorter and more strongly arcuate, the elytra are equal in width at base and behind middle, the pubescent design is different, and the carina on the pygidium does not project behind the apex of the segment.

*Agrilus bettotanus* sp. n.

*Female*.—Small, slender, and moderately attenuate posteriorly; head slightly aeneous behind the epistoma, but becoming bottle green posteriorly; pronotum greenish blue, becoming slightly more greenish at the sides; elytra aeneous, becoming slightly purplish toward the apex, rather strongly shining, clothed with white pubescence, and with a small irregular dark area at apical third; beneath aeneous, with a vague cupreous tinge.

Head with the front wide, slightly convex, about equal in width at top and bottom, with a shallow longitudinal depression on the vertex and occiput, and the lateral margins broadly, vaguely constricted on the front; surface finely, densely granulose, finely, but not closely rugose, the rugae more or less transverse on the front, and coarser behind the epistoma, finely, sparsely punctate between the rugae, and clothed with a few short hairs behind the epistoma; epistoma slightly transverse between the antennae, broadly, vaguely emarginate or subtruncate in front, and the clypeal suture distinct; antennae extending to basal fourth of pronotum, serrate from the fourth joint, and the outer joints about as wide as long; eyes large, rather broadly oblong, and slightly more acutely rounded beneath than above.

Pronotum one-fourth wider than long, about equal in width at base and apex, and widest at middle; sides vaguely, arcuately rounded from apical angles to posterior angles, which are vaguely expanded; when viewed from the side the marginal and submarginal carinae are slightly sinuate, rather narrowly separated anteriorly, and connected to each other at the base; anterior margin strongly sinuate, with the median lobe strongly produced and broadly rounded; base strongly, angularly emarginate at middle of each elytron, with the median lobe broadly, vaguely emarginate in front of scutellum; disk broadly, rather deeply concave along basal half, the concavity extending obliquely forward on each side to apical third, and with short, distinct, arcuate prehumeral carinae, which extend from the posterior angles forward to the lateral margins at middle; surface coarsely, but not closely, irregularly rugose, and finely, sparsely punctate between the rugae. Scutellum strongly, transversely carinate, and the surface finely, densely reticulate.

Elytra slightly wider than pronotum at base, and about equal in width at base and behind middle; sides nearly parallel from humeral angles to behind middle (vaguely

constricted in front of middle), then obliquely narrowed to the tips, which are separately narrowly rounded and coarsely, irregularly serrate; disk slightly flattened, sutural, margins slightly elevated posteriorly, and with broad, shallow basal depressions; surface densely, coarsely imbricate-punctate, and each elytron ornamented with a pubescent vitta composed of uniformly distributed, recumbent white hairs, the vitta covering the sutural half, slightly expanded externally behind the middle, and partially enclosing an irregular dark spot along the sutural margin at apical third.

Abdomen beneath vaguely granulose, rather densely, finely punctate, sparsely marked with fine crenulate lines on basal segment, and sparsely, uniformly clothed with short, recumbent white hairs; first segment strongly convex at middle; last segment broadly rounded at apex; vertical portions of segments not conspicuously pubescent; sides scarcely exposed above; pygidium longitudinally carinate, but the carina not projecting at apex. Prosternum sparsely, coarsely punctate, and sparsely clothed with short, recumbent whitish hairs; prosternal lobe broad, rather strongly declivous, and feebly arcuately emarginate in front; prosternal process broad, the sides slightly elevated, parallel to behind the coxal cavities, then abruptly narrowed to the apex, which is acute. Tibiae slender, anterior pair slightly arcuate, and all pairs unarmed at apex. Posterior tarsi about one-half as long as the tibiae, and the first joint as long as the following three joints united. Tarsal claws similar on all feet, cleft near the middle, the inner tooth much shorter than outer one, and not turned inward.

Length, 5.25 millimeters; width, 1.25 millimeters.

*Type locality*.—Bettotan, North Borneo.

*Type*.—United States National Museum.

Described from a single female collected at the type locality, near Sandakan, August 21, 1927, by C. B. Kloss and H. M. Pendlebury.

This species is allied to *oppositus* Obenberger, but differs from that species in being larger, the pronotum greenish blue, with the prehumeral carinae shorter and more arcuate, and with the basal half transversely concave, the elytra more bronzy green, and the transverse dark area at apical third not extending from the sutural to the lateral margin, and the prosternal lobe is distinctly emarginate in front.

*Agrilus kayan*, sp. n.

*Female*.—Rather small, slender, and moderately attenuate posteriorly; head aeneo-cupreous in front, but becoming olivaceous green on the occiput; pronotum and elytra olivaceous green, the former slightly more aureous at the sides, and the latter vaguely purplish toward the

apex, and each elytron ornamented with a longitudinal pubescent vitta; beneath aeneous, with a vague cupreous reflection.

Head with the front wide, nearly flat, distinctly wider at bottom than top, with a distinct longitudinal depression on the vertex and occiput, and the lateral margins slightly expanded at the vertex and bottom; surface vaguely granulose, coarsely rugose, the rugae transverse on the front and longitudinal on the occiput, finely, sparsely punctate between the rugae, and clothed with a few long white hairs along the lateral margins and behind the epistoma; epistoma distinctly transverse between the antennae, vaguely arcuately emarginate in front, and the clypeal suture distinct; antennae extending to basal fourth of pronotum, serrate from the fourth joint, and the outer joints as wide as long; eyes large, broadly oblong, and slightly more acutely rounded beneath than above.

Pronotum about three-fourths wider than long, slightly wider at apex than base, and widest along apical half; sides vaguely narrowed at apical angles, nearly parallel to middle, then strongly narrowed to the posterior angles, which are rectangular; when viewed from the side the marginal and submarginal carinae are strongly sinuate, narrowly separated anteriorly, and connected to each other behind the middle; anterior margin strongly sinuate, with the median lobe strongly produced and broadly rounded; base strongly angularly emarginate at middle of each elytron, and with the median lobe broadly subtruncate in front of scutellum; disk vaguely concave along basal half, a deeper oblique depression on each side extending forward to the apical third, and with short, strongly elevated, arcuate prehumeral carinae, which extend from the posterior angles forward to the lateral margins at middle; surface densely, coarsely rugose, and finely, sparsely punctate between the rugae. Scutellum strongly, transversely, carinate, and the surface finely, densely reticulate.

Elytra slightly wider than pronotum at base, and about equal in width at base and behind middle; sides vaguely expanded behind base, broadly arcuately constricted in front of middle, broadly arcuately expanded behind middle, then strongly obliquely narrowed to the tips, which are separately narrowly rounded, and coarsely serrate; disk slightly flattened, sutural margins strongly elevated posteriorly, and with broad, moderately deep basal depressions; surface densely, coarsely imbricate-punctate or granulose on basal half, much finer posteriorly, sparsely clothed with short inconspicuous hairs, and each elytron ornamented with a broad whitish pubescent vitta, covering the sutural half, more strongly expanded on apical third, and extending from base to apex.

Abdomen beneath vaguely granulose, densely marked with more or less transverse crenulate lines, finely, densely punctate, and densely, uniformly clothed with short, recumbent white hairs; first segment strongly convex at middle; last segment broadly rounded at apex, with the marginal groove deep, extending to anterior margin of segment, and arcuately emarginate at apex; vertical portions of segments not conspicuously pubescent; sides not visible from above; pygidium strongly, longitudinally carinate, the carina strongly projecting and emarginate at apex. Prosternum rather densely, coarsely scabrous, and sparsely clothed with short recumbent hairs; prosternal lobe broad, rather strongly declivous, and broadly, but not deeply, arcuately emarginate in front; prosternal process broad, the sides strongly expanded behind the coxal cavities, with the apex broadly, transversely biemarginate, and the median tooth longer and acute. Tibiae slender, the anterior pair slightly arcuate, and all pairs unarmed at apex. Posterior tarsi about one-half as long as the tibiae, and the first joint as long as the following three joints united. Tarsal claws similar on all feet, cleft near middle, the inner tooth shorter than outer one, and not turned inward.

Length, 5.5 millimeters; width, 1.5 millimeters.

*Type locality*.—Bettotan, North Borneo.

*Type*.—United States National Museum.

Described from a single female collected at the type locality, near Sandakan, August 16, 1927, by C. B. Kloss and H. M. Pendlebury.

This species is allied to *semipubescent* Fisher, but differs from that species in having the prehumeral carinae on the pronotum strongly elevated, the tips of the elytra more acutely rounded, and the pygidium armed with a long projecting carina at the apex. The species is named after one of the native tribes.

*Agrilus kudatensis*, sp. n.

*Male*.—Small, rather robust, and slightly attenuate posteriorly; head olivaceous green; pronotum aeneous, with a vague purplish tinge on the median part; elytra aeneous, except for a broad, oblique violaceous brown fascia at apical third, and a similar colored large semioval spot along lateral margin in front of middle, and ornamented with white pubescent designs; beneath aeneous, and more strongly shining than above.

Head with the front rather narrow, slightly convex, slightly wider at bottom than top, without distinct depressions, and the lateral margins obliquely expanded toward the bottom; surface densely, coarsely punctate, somewhat rugose, and rather densely clothed with long, recumbent silky white hairs; epistoma not transverse between the

antennae, the anterior margin vaguely, arcuately emarginate, and the clypeal suture indistinct; antennae short, extending scarcely beyond the anterior margin of pronotum, serrate from the fourth joint, and the outer joints slightly wider than long; eyes rather small, narrowly oblong, and more acutely rounded beneath than above.

Pronotum one-half wider than long, wider at apex than base, and widest at apical fourth; sides vaguely expanded at apical fourth, then obliquely narrowed to the posterior angles, which are rectangular; when viewed from the side the marginal and submarginal carinae are vaguely sinuate, very widely separated anteriorly, and connected to each other behind the middle; anterior margin strongly sinuate, with the median lobe slightly produced and broadly rounded; base broadly arcuately emarginate at middle of each elytron, with the median lobe narrowly, arcuately emarginate in front of scutellum; disk broadly, vaguely depressed in front of scutellum, without distinct lateral depressions, but with long, strongly elevated, arcuate prehumeral carinae, which extend from the posterior angles forward to middle near lateral margins; surface coarsely, densely, irregularly rugose, the rugae not sharply elevated, finely, densely punctate, and clothed with a few short, inconspicuous hairs at the sides. Scutellum strongly, transversely carinate, and the surface finely, densely reticulate.

Elytra slightly wider than pronotum at base, and vaguely wider at base than behind middle; sides feebly narrowed from humeral angles to behind middle, then arcuately narrowed to the tips, which are separately broadly rounded and finely serrate; disk vaguely flattened, and with rather deep, broad basal depressions; surface densely, coarsely imbricate-punctate, sparsely clothed with inconspicuous dark hairs, and each elytron ornamented with white pubescent markings as follows; a large transverse fascia covering the basal sixth, a similar fascia just behind the middle, and narrowly connected along the sutural margin with the basal fascia, and a large spot covering the apical fourth, with the anterior margin of the spot oblique.

Abdomen beneath densely marked with fine, transverse crenulate lines, finely, sparsely punctate, and sparsely, uniformly clothed with short, recumbent white hairs; first segment strongly convex at middle; last segment broadly subtruncate at apex, with the marginal groove deep, extending to anterior margin of segment, and deeply, angularly emarginate at the apex; vertical portions of the segments not conspicuously pubescent; sides scarcely visible from above; pygidium broadly rounded at apex, and without a projecting carina. Prosternum sparsely, coarsely punctate, and sparsely clothed with short, semierect white hairs; prosternal lobe broad, strongly declivous, and broadly



rounded in front; prosternal process broad, the sides strongly expanded behind the coxal cavities, the apex broad, with a distinct tooth at the middle. Tibiae slender, straight, and the anterior and middle pairs armed with a very short tooth on the inner margin at apex. Posterior tarsi about one-half as long as the tibiae, and the first joint as long as the following two joints united. Tarsal claws dissimilar, anterior and middle claws cleft near the tip, and the teeth nearly equal in length, but the inner ones not turned inward; posterior claws cleft near middle, and the inner tooth much shorter than outer one.

Length, 3.5 millimeters; width, 1 millimeter.

*Type locality*.—Kudat, North Borneo.

*Type*.—United States National Museum.

Described from a unique male collected at the type locality, September 12, 1927, by C. B. Kloss and H. M. Pendlebury.

In Obenberger's table to the Malaysian *Agrilus* (Philip. Journ. Sci., vol. 25, 1924, p. 564), this species runs to *palawanensis* Fisher, but it differs from that species in being much smaller, the upper surface bronzy, with violaceous areas on the elytra, the pronotum only vaguely depressed in front of the scutellum, and the pubescence on the elytra forming transverse fasciae.

#### ***Agrilus cyanochloris*.**

*Female*.—Small, short, robust, and rather strongly attenuate posteriorly; head bright green, becoming vaguely cupreous behind the epistoma and on occiput; pronotum aureo-viridis; elytra dark green, with a vague bluish reflection, becoming purplish black toward the apex, and ornamented with a short narrow pubescent vitta near apex; beneath aureo-viridis, and more strongly shining than above.

Head with the front rather narrow, slightly convex, slightly wider at bottom than top, with a vague longitudinal depression on the occiput, and the lateral margins obliquely converging from bottom to top; surface coarsely, but not deeply, irregularly rugose, the rugae more or less transverse on the front, coarsely, irregularly punctate, and clothed with a few long, recumbent white hairs behind the epistoma and along the lateral margins; epistoma not transverse between the antennae, strongly elevated, strongly, transversely carinate at middle, and the anterior margin transversely truncate; antennae extending to basal third of pronotum, serrate from the fourth joint, and the outer joints slightly wider than long; eyes large, broadly oblong, and slightly more acutely rounded beneath than above.

Pronotum nearly two times as wide as long, slightly wider at base than at apex, and widest at apical third; sides arcuately expanded to apical third, then slightly, obliquely

narrowed to the posterior angles, which are obtusely rounded; when viewed from the side the marginal and submarginal carinae are nearly straight, parallel and narrowly separated, and connected to each other near the base, where the submarginal one is abruptly depressed; anterior margin strongly sinuate, with the median lobe rather strongly produced and broadly rounded; base strongly, angularly emarginate at middle of each elytron, and the median lobe very broad, and broadly subtruncate in front of scutellum; disk uniformly convex, and without depressions or distinct prehumeral carinae; surface coarsely, transversely rugose, the rugae close together and strongly elevated, and sparsely, finely punctate between the rugae. Scutellum strongly, transversely carinate, and the surface densely reticulate.

Elytra slightly wider than pronotum at base, and about equal in width at base and behind middle; sides nearly parallel to behind middle, then strongly, obliquely narrowed to the tips, which are conjointly broadly rounded, and coarsely serrate; disk vaguely convex, sutural margins scarcely elevated posteriorly, but with broad, shallow basal depressions; surface coarsely, densely imbricate-punctate, densely clothed with short, erect, inconspicuous dark hairs, and each elytron ornamented with a short vitta of yellowish hairs along sutural margin at apical fourth.

Abdomen beneath vaguely granulose, densely marked with more or less transverse crenulate lines, finely, densely punctate, and rather densely, uniformly clothed with short, recumbent white hairs; first segment strongly convex at middle; last segment broadly rounded at apex, with the marginal groove deep, extending to anterior margin of segment, and vaguely sinuate at apex; vertical portions of segments not conspicuously pubescent; sides scarcely visible from above; pygidium longitudinally carinate, but the carina not projecting. Prosternum densely, coarsely rugose, and clothed with a few short white hairs; prosternal lobe broad, moderately declivous, and broadly, but not deeply, emarginate in front; prosternal process broad, the sides parallel to behind the coxal cavities, then abruptly narrowed to the apex, which is obtusely rounded. Tibiae slender, straight, and unarmed at apex. Posterior tarsi about one-half as long as the tibiae, and the first joint as long as the following two joints united. Tarsal claws similar on all feet, cleft near the middle, the inner tooth shorter than outer one, and not turned inward.

Length, 4.5—4.75 millimeters; width, 1.6—1.75 millimeters.

*Type locality*.—Bettotan, North Borneo.

*Other localities*.—Samawang, North Borneo.

*Type*.—United States National Museum.

*Paratypes*.—Selangor Museum, Kuala Lumpur, Federated Malay States.

Described from three females. The type and one paratype collected at the type locality, near Sandakan, August 5 and 9, 1927, and one paratype collected at Samawang, July 12, 1927, by C. B. Kloss and H. M. Pendlebury.

This species is allied to *zamboangensis* Fisher, described from the Philippine Islands, but differs from that species in having the elytra of a bluish green color, and ornamented with distinct, short, pubescent vittae along the sutural margins near the apex.

*Agrilus curtus* sp. n.

*Male*.—Small, rather short and robust, and moderately attenuate posteriorly; head bright green; pronotum and elytra olivaceous green, the former slightly more aureous; beneath aeneo-brunneus, with a slight greenish reflection in certain lights.

Head with the front rather wide, slightly convex, about equal in width at bottom and top, with a vague longitudinal depression on the vertex and occiput, and the lateral margins nearly parallel; surface finely, densely granulose, coarsely, irregularly punctate, more densely behind the epistoma, vaguely rugose, the rugae longitudinal on the occiput and more or less transverse on the front, and densely clothed with long, erect yellowish hairs behind the epistoma; epistoma slightly transverse between the antennae, strongly elevated, and the anterior margin feebly, broadly arcuately emarginate; antennae extending to basal fourth of pronotum, serrate from the fourth joint, and the outer joints about as wide as long; eyes large, broadly oblong, and slightly more acutely rounded beneath than above.

Pronotum about one-fourth wider than long, equal in width at base and apex, and widest at middle, sides feebly, arcuately rounded; when viewed from the side the marginal and submarginal carinae are nearly straight, narrowly separated anteriorly, and connected to each other behind the middle; anterior margin strongly sinuate, with the median lobe strongly produced and broadly rounded; base broadly arcuately emarginate at middle of each elytron, with the median lobe broadly subtruncate in front of scutellum; disk broadly, deeply concave in front of scutellum, the depression shallower on each side, and extending obliquely forward to the apical fourth, where it is more deeply depressed, and with long, rather strongly elevated, sinuate prehumeral carinae, which extend from the posterior angles forward to the lateral margins near apex; surface coarsely, densely, irregularly rugose, and finely punctate between the rugae. Scutellum strongly, transversely carinate, and the surface finely, densely reticulate.

Elytra slightly wider than pronotum at base, and about equal in width at base and behind middle; sides slightly expanded behind base, vaguely constricted in front of middle, broadly arcuately expanded behind middle, then obliquely narrowed to the tips, which are separately, narrowly rounded, and finely serrate; disk vaguely flattened, sutural margins slightly elevated behind middle, and with broad, deep basal depressions, and distinct straight lateral carinae extending from the humeral angles to near the middle; surface coarsely, densely imbricate-punctate, and densely, uniformly clothed with short, semierect yellowish hairs.

Abdomen beneath finely, densely granulose, densely marked with more or less transverse crenulate lines, finely punctate, and rather densely, uniformly clothed with short, recumbent white hairs; first segment strongly convex at middle; last segment broadly rounded or subtruncate at apex, with the marginal groove deep, extending to anterior margin of segment, and sinuate at apex; vertical portions of segments not conspicuously pubescent; sides not visible from above; pygidium without a projecting carina. Prosternum coarsely, densely rugose, and clothed with a few short, recumbent white hairs; prosternal lobe broad, moderately declivous, and broadly rounded or subtruncate in front; prosternal process rather broad, the sides slightly expanded behind the coxal cavities, and the apex broadly transverse, with the median tooth acute. Tibiae slender, straight, and the anterior and middle pairs armed with a distinct tooth on inner margin at apex. Posterior tarsi about one-half as long as the tibiae, and the first joint as long as the following three joints united. Tarsal claws dissimilar, anterior claws cleft near the tip, the teeth nearly equal in length, and the inner tooth slightly turned inward, but the tips distant; middle and posterior claws cleft near middle, and the inner tooth distinctly shorter than outer one.

Length, 4.5 millimeters; width, 1.25 millimeters.

*Female*.—Differs from the male in having the head greenish black in front, the tibiae unarmed at apex, and the tarsal claws similar on all feet, cleft near the middle, the inner tooth distinctly shorter than outer one, and vaguely turned inward.

Length, 3.5 millimeters; width, 1 millimeter.

*Type locality*.—Bettotan, North Borneo.

*Other localities*.—Samawang, North Borneo.

*Type*.—United States National Museum.

*Allotype*.—Selangor Museum, Kuala Lumpur, Federated Malay States.

Described from two examples. The type (male) collected at the type locality, near Sandakan, July 28, 1927, and the allotype (female) collected at Samawang, July 15, 1927, by C. B. Kloss and H. M. Pendlebury.

This species is closely allied to *agrestis* Deyrolle, but it differs from that species in being more slender and the color above more olivaceous green, the sides of the head in front more parallel, the surface of the pronotum coarsely rugose, the elytra more finely punctate and more densely pubescent, with the lateral carinae extending nearly to the middle of the elytra, and the tips separately rounded.

*Agrilus samboides* sp. n.

*Female*.—Small short, rather robust, and slightly attenuate posteriorly; head, pronotum and elytra dark brown, with a more or less distinct cupreous and purplish tinge in certain lights, the elytra with the tips aeneous, and the surface variegated with white and yellow pubescence; beneath piceous, with a vague aeneous reflection.

Head with the front wide, moderately convex, distinctly wider at top than bottom, with a longitudinal depression on the occiput and vertex, and the lateral margins obliquely converging from top to bottom; surface sparsely coarsely punctate, vaguely rugose, and rather densely clothed with long, semi-erect yellowish hairs; epistoma not transverse between the antennae, elevated, transversely carinate at the middle, and the anterior margin vaguely arcuately emarginate or subtruncate; antennae extending to basal fourth of pronotum, serrate from the fifth joint, and the outer joints wider than long; eyes small, broadly oblong, and equally rounded above and beneath.

Pronotum one-half wider than long, distinctly wider at base than apex, and widest at base; sides strongly, obliquely expanded from apical angles to posterior angles, which are acutely angulated; when viewed from the side the marginal and submarginal carinae are strongly sinuate, very widely separated, and connected to each other at apex and near the base; anterior margin strongly sinuate, with the median lobe strongly produced and broadly rounded; base strongly angularly emarginate at middle of each elytron, and the median lobe slightly produced and very broadly rounded; disk strongly, uniformly convex at middle, with a broad, irregular depression on each side along lateral margin, and with distinct, strongly arcuate prehumeral carinae, which extend from the posterior angles forward to near the lateral margins in front of middle; surface coarsely, vaguely rugose, the rugae more or less oblique at middle, sparsely, coarsely punctate, and sparsely, irregularly clothed with long whitish and yellowish hairs intermixed. Scutellum strongly, transversely carinate, and the surface finely, densely reticulate.

Elytra not wider than pronotum at base, and about equal in width at base and behind middle; sides slightly expanded behind base, broadly arcuately constricted in front of middle, broadly arcuately expanded behind middle,

then obliquely narrowed to the tips, which are separately, very broadly rounded, and coarsely serrate; disk slightly convex, sutural margins vaguely elevated posteriorly, with broad, moderately deep basal depressions, and with short lateral carinae on the humeri; surface coarsely, densely imbricate-punctate, densely clothed with long semierect pale yellow, golden yellow, and dark brown hairs intermixed, the yellow hairs more distinct at apex, and each elytron ornamented with white hairs as follows: a few scattered hairs along sutural margin on basal third, a more distinct round spot near middle, and a more or less distinct, oblique, irregular fascia behind the middle.

Abdomen beneath finely, densely marked with more or less transverse crenulate lines, finely punctate, and rather densely, uniformly clothed with long, recumbent white hairs; first segment strongly convex at middle; last segment broadly subtruncate at apex, and the marginal groove deeply, arcuately emarginate at apex; vertical portions of the segments not conspicuously pubescent; sides not visible from above; pygidium without a projecting carina. Prosternum rather densely, coarsely rugose, and sparsely clothed with short, recumbent white hairs; prosternal process broad, moderately declivous, and broadly vaguely emarginate in front; prosternal process rather narrow, and the sides obliquely narrowed to the apex, which is acute. Tibiae slender, straight, and unarmed at apex. Posterior tarsi one-half as long as the tibiae, and the first joint only slightly longer than the second. Tarsal claws similar on all feet, cleft near the middle, the inner tooth distinctly shorter and broader than outer one, and not turned inward.

Length, 4 millimeters; width, 1 millimeter.

*Type locality*.—Kudat, North Borneo.

*Type*.—United States National Museum.

Described from a single female collected at the type locality, September 13, 1927, by C. B. Kloss and H. M. Pendlebury.

This species is closely allied to *harlequin* Obenberger, but it differs from that species in being smaller, the sides of the pronotum more strongly converging toward the apex, and the prehumeral carinae longer, the pubescent design on the elytra is different, the tips of the elytra more broadly rounded, and with short lateral carinae on the humeri, and the sides of the prosternal process are obliquely narrowed to behind the coxal cavities. In general form this species resembles the species of the genus *Sambus* Deyrolle.

*Agrilus kenniah* sp. n.

*Male*.—Small, elongate, and moderately attenuate posteriorly; head aeneo-viridis in front, but becoming

blackish on the occiput; pronotum aeneous; elytra greenish black; beneath piceous, with a vague greenish or aeneous reflection, and more strongly shining than above.

Head with the front rather wide, strongly convex, about equal in width at bottom and top, with a vague longitudinal depression on the occiput, and the lateral margins nearly parallel; surface densely, coarsely granulose, with a few vague, coarse punctures intermixed, and densely clothed with long, semierect yellowish hairs behind the epistoma; epistoma slightly transverse between the antennae, strongly elevated, and broadly, vaguely arcuately emarginate or subtruncate in front; antennae extending to basal fourth of pronotum, serrate from the fifth joint (fourth joint vaguely serrate), and the outer joints slightly wider than long; eyes large, broadly oblong, and about equally rounded above and beneath.

Pronotum nearly two-thirds wider than long, about equal in width at base and apex, and widest at middle; sides rather strongly arcuately rounded; when viewed from the side the marginal carina is nearly straight, and without a submarginal carina; anterior margin strongly sinuate, with the median lobe strongly produced and broadly rounded; base feebly arcuately emarginate at middle of each elytron, with the median lobe feebly produced, and broadly subtruncate in front of scutellum; disk broadly, deeply concave along basal half, the concavity extending obliquely forward on each side to the apical angles, and with slightly arcuate prehumeral carinae, extending from posterior angles forward to the lateral margins at middle, but the carinae not strongly elevated; surface vaguely granulose, coarsely, vaguely rugose, the rugae more or less oblique at middle, finely, sparsely punctate, and glabrous. Scutellum vaguely transversely carinate, and the surface densely, finely reticulate.

Elytra slightly wider than pronotum at base, and about equal in width at base and middle; sides broadly expanded behind base, broadly arcuately constricted in front of middle, broadly arcuately expanded at middle, then obliquely narrowed to the tips, which are separately, rather narrowly rounded, and finely, irregularly serrate; disk vaguely flattened, sutural margins slightly elevated posteriorly, with broad, shallow basal depressions, and with long lateral carinae, which extend from the humeral angles to behind the middle; surface finely, densely rugose or imbricate-punctate, and sparsely, uniformly clothed with short, recumbent whitish hairs.

Abdomen beneath vaguely granulose, vaguely, longitudinally rugose, except on last segment which is coarsely, densely granulose and glabrous; first segment strongly convex; last segment broadly rounded at apex; vertical

portions of segments not pubescent; sides not visible from above; pygidium without a projecting carina. Prosternum nearly smooth and glabrous; prosternal lobe broad, moderately declivous, and broadly rounded in front; prosternal process rather narrow, the sides nearly parallel to behind the coxal cavities, then obliquely narrowed to the apex, which is acute. Tibiae slender, straight, and the anterior and middle pairs armed with a short tooth on the inner margin at apex. Posterior tarsi about two-thirds as long as the tibiae, and the first joint as long as the following three joints united. Tarsal claws dissimilar, anterior claws cleft near the tip, the teeth nearly equal in length, and the inner tooth vaguely turned inward, but the tips distant; middle and posterior claws cleft near middle, and the inner tooth distinctly shorter than the outer one.

Length, 3.25 millimeters; width, 0.8 millimeter.

*Type locality*.—Bettotan, North Borneo.

*Type*.—United States National Museum.

Described from a single male collected at the type locality, near Sandakan, August 14, 1927, by C. B. Kloss and H. M. Pendlebury.

This species resembles *lazar* Obenberger, described from Singapore, but it differs from that species in not having a submarginal carina on each side of the pronotum. The species is named after one of the native tribes.

*Trachys klossi* sp. n.

Broadly ovate, slightly convex, moderately expanded anteriorly, and widest at base of pronotum; head aeneous, and strongly shining; pronotum and elytra dark brown, subopaque, with a more or less aeneous tinge, especially at sides of pronotum, and densely clothed with white, yellow, and brownish black pubescence, which forms more or less distinct designs; beneath black, with a slight aeneous reflection, and more strongly shining than above.

Head with the front broadly, rather deeply concave between the eyes, with a vague, narrow median groove extending from the occiput to middle of front, and the two median postoral pores distinct and widely separated; surface vaguely, irregularly ocellate-punctate, and rather sparsely, irregularly clothed with long, recumbent whitish and reddish brown hairs intermixed; eyes rather strongly margined on inner side, and strongly converging toward the bottom; epistoma slightly elevated, very short, strongly transverse between the antennae, anterior margin broadly, vaguely arcuately emarginate, and the surface transversely striolate; clypeal suture distinct, and transversely sinuate.

Pronotum four times as wide as long at middle, much narrower at apex than base, and widest at base; sides



rounded near posterior angles, then strongly obliquely narrowed to the apical angles, which are acute and extend forward on a line with the middle of the eyes; posterior angles obtuse, and produced slightly backward beyond the humeral angles of elytra; anterior margin broadly, deeply arcuately emarginate; base feebly transversely sinuate, with the median lobe broadly rounded and moderately produced; disk slightly convex, broadly, but not deeply, triangularly depressed at the sides, the anterior margin of the depression extending from the lateral margins at apical third, obliquely backward to the base near middle, and with a broad, vague elevation on each side along lateral margin at middle: surface densely, strongly ocellate-punctate, and densely clothed with long, recumbent white, yellow, and brownish black hairs intermixed, without forming any distinct designs. Scutellum rather large and triangular.

Elytra distinctly narrower than the pronotum at base, and widest at base; sides slightly arcuately narrowed from the base to near the tips (vaguely sinuate near basal third); tips broadly, conjointly rounded; humeri rather prominent, rounded, but not carinate; each elytron with a distinct lateral carina, very close to the lateral margin, and extending from behind the humerus to near the apical margin, with a broad, transverse basal depression, and a shallow depression along the lateral margin behind the humerus; surface rather sparsely, finely punctate, more or less scabrous in basal region, and densely clothed with long, semierect white, yellow, and brownish black hairs, without forming any distinct designs, except near the apex, where the white hairs form two vaguely distinct transverse zigzag fasciae, with a round spot of yellowish hairs on each elytron near sutural margin at apical third.

Beneath moderately convex; abdomen finely granulose, densely ocellate-punctate, the ocelli open posteriorly, becoming more oblong and distinct at sides of basal segments, and rather densely clothed with recumbent white hairs. Prosternum feebly declivous anteriorly, the anterior margin broadly rounded and slightly margined; prosternal process strongly elevated, nearly two times as wide as long, narrower in front than behind, and the sides strongly, obliquely expanded to the apex, which is broadly subtruncate. Tarsi black, and the tarsal lamellae brownish white.

Length, 3.25 millimeters; width, 2.25 millimeters.

*Type locality*.—Kudat, North Borneo.

*Type*.—United States National Museum.

Described from a single example collected at the type locality, September 5, 1927, by C. B. Kloss and H. M. Pendlebury.

This species has very distinct longitudinal carinae on the elytra, but differs from all the other species of this

genus examined by having these carinae close to, and parallel with the lateral margins, and not on the humeri and extending backward, as is usually the case where the carinae are present.

***Trachys pendleburyi* sp. n.**

Broadly oblong, rather strongly convex, about equally rounded in front and behind, and widest along basal half of elytra; head aureo-aeneous, and strongly shining; pronotum aeneous, slightly darker on median part, and rather densely clothed with white and golden yellow hairs; elytra violaceous blue, becoming aenco-cupreous toward the apex, and rather densely clothed with white and golden yellow hairs; beneath black, with a distinct aeneous tinge, and more strongly shining than above.

Head with the front deeply concave between the eyes, without a distinct median groove, but with the two median postoral pores distinct and not very widely separated; surface densely ocellate-punctate, and densely clothed with long, recumbent golden yellow pubescence, which nearly conceals the surface; eyes scarcely margined on the inner side, and very strongly converging toward the bottom; epistoma not elevated, nearly square between the antennae, anterior margin semicircularly emarginate, and the surface densely reticulate; clypeal suture not distinct.

Pronotum three times as wide as long at middle, much narrower at apex than base, and widest at base; sides strongly, obliquely narrowed from base to apical angles, which are acute, and extend forward on a line with the posterior part of the eyes; posterior angles acute and produced slightly backward; anterior margin broadly arcuately emarginate; base transversely sinuate, with the median lobe broadly rounded and moderately produced; disk rather strongly, regularly convex, and without distinct depressions; surface densely, distinctly ocellate-punctate, and rather densely clothed with long, semierect hairs, which are golden yellow on the apical half, and white on the basal half.

Scutellum small and triangular.

Elytra slightly wider than pronotum at base; sides nearly parallel from base to behind middle, then strongly arcuately narrowed to the tips, which are conjointly broadly rounded; humeri not prominent; disk without lateral carinae, but each elytron vaguely depressed at base and along lateral margin behind the humerus; surface finely, rather densely punctate, and rather densely, uniformly clothed with semierect white and golden yellow hairs, the white hairs covering the basal three-fourths, except for a large median area common to both elytra, where the surface is clothed with inconspicuous black hairs, and the golden yellow hairs

covering the apical fourth, with the anterior margin of the area extending slightly obliquely forward to the lateral margins.

Beneath moderately convex; abdomen densely ocellate-punctate, the ocelli open posteriorly, more or less connected transversely, more distinct and confluent on the basal segment, and sparsely clothed with short, inconspicuous hairs. Prosternum short, strongly declivous, the anterior margin transversely truncate, and strongly margined; prosternal process strongly elevated, nearly two times as long as wide, narrower in front than behind, the sides strongly obliquely expanded to the apex, which is broadly rounded. Tarsi orange yellow, except the last joint, which is black, and the tarsal lamellae whitish.

Length, 2.6 millimeters; width, 1.6 millimeters.

*Type locality*.—Bettotan, North Borneo.

*Type*.—United States National Museum.

Described from a single example collected at the type locality, near Sandakan, July 23, 1927, by C. B. Kloss and H. M. Pendlebury.

This species is allied to *cupripyga* Deyrolle, but that species differs from *pendleburyi* in having the pubescence on the head and pronotum of a uniform pale yellow color, and the basal two-thirds of the elytra is clothed with inconspicuous black hairs.

***Trachys aeneocephalus* sp. n.**

Rather narrowly oblong, moderately convex, slightly expanded anteriorly, and widest at base of elytra; head and pronotum aureo-aeneous, strongly shining, and rather densely clothed with pale yellow pubescence; elytra black, with a vague purplish reflection, moderately shining, and ornamented with pale yellow and white pubescent designs; beneath black, with a distinct aeneous tinge.

Head with the front deeply concave between the eyes, without a distinct median groove, but with the two median postoral pores distinct and rather widely separated; surface densely ocellate-punctate, and densely clothed with long, recumbent lemon yellow pubescence; eyes slightly margined on the inner side, and very strongly converging toward the bottom; epistoma not elevated, rather short, slightly transverse between the antennae, anterior margin semicircularly emarginate, and the surface densely, transversely striolate; clypeal suture distinct, and transversely truncate.

Pronotum nearly three times as wide as long at middle, much narrower at apex than base, and widest at base; sides feebly arcuately narrowed from base to apical angles, which are acute and extend forward on a line with the middle of the eyes; posterior angles nearly rectangular; anterior

margin broadly, deeply, arcuately emarginate; base transversely sinuate, with the median lobe broadly rounded and moderately produced; disk slightly convex, and broadly, vaguely flattened toward the sides; surface densely, distinctly ocellate-punctate, and rather densely, uniformly clothed with long, semierect lemon yellow hairs. Scutellum small and triangular.

Elytra distinctly wider than pronotum at base, and widest at base; sides slightly narrowed from base to middle (feebly sinuate in front of middle), then more strongly arcuately narrowed to near the tips, which are conjointly broadly rounded; humeri not very prominent; disk without lateral carinae, but each elytron with a broad, shallow basal depression, and a similar depression along lateral margin behind the humerus; surface finely, sparsely punctate, sparsely clothed with erect, inconspicuous black hairs, and each elytron ornamented with pale yellow and white pubescent designs as follows: a strongly sinuate longitudinal vitta of pale yellow hairs extending along the sutural margin from scutellum to apical third, where it is connected to a transverse irregular fascia of white hairs, the fascia broadly expanded at the lateral margin, a vague median spot of white and yellow hairs in front of middle, and a small spot of white hairs at the apex.

Beneath rather strongly convex; abdomen densely ocellate-punctate, the ocelli open posteriorly, more or less connected transversely, and sparsely clothed with short, inconspicuous hairs. Prosternum short, strongly declivous, the anterior margin broadly rounded and strongly margined; prosternal process strongly elevated, two times as long as wide, slightly narrower in front than behind, the sides arcuately constricted, and the apex broadly rounded. Tarsi orange yellow, except the last joint, which is black, and the tarsal lamellae whitish.

Length, 2.75 millimeters; width, 1.6 millimeters.

*Type locality*.—Kudat, North Borneo.

*Type*.—United States National Museum.

Described from a single example collected at the type locality, September 13, 1927, by C. B. Kloss and H. M. Pendlebury.

This species is closely allied to *scriptella* Obenberger, described from Singapore, but it differs from that species in having the epistoma slightly transverse between the antennae, the eyes more strongly margined on the inner side, the head and pronotum more densely clothed with pale yellow pubescence, and the pubescent markings on the elytra, although similar, are much narrower and more distinct.

***Trachys bettotanus* sp. n.**

Rather narrowly ovate, slightly convex, moderately expanded anteriorly, and widest at base of elytra; above dark brown, with a distinct aeneous or cupreous tinge, moderately shining, and rather densely clothed with white, pale yellow, and reddish brown hairs intermixed, without forming any distinct designs, except for a large round dark area at apex common to both elytra; beneath dark brown, with a strong aeneous and purplish tinge, and more strongly shining than above.

Head with the front broad, slightly concave between the eyes, with a vague, narrow median groove extending from occiput to epistoma, and the two median postoral pores distinct and widely separated; surface vaguely, densely ocellate-punctate, and rather densely, uniformly clothed with long, recumbent whitish and golden yellow hairs intermixed; epistoma slightly elevated, moderately short, strongly transverse between the antennae, anterior margin semicircularly emarginate, and the surface densely reticulate; clypeal suture not very distinct.

Pronotum slightly more than three times as wide as long at middle, much narrower at apex than base, and widest at base; sides feebly arcuately narrowed from base to apical angles, which are acute and extend forward on a line with the posterior part of the eyes; posterior angles acute, but not produced backward beyond the humeral angles of elytra; anterior margin broadly, but not deeply, arcuately emarginate; base strongly, transversely sinuate, with the median lobe broadly, subangularly rounded, and strongly produced; disk slightly convex, with a narrow, vague depression along the posterior margin of basal lobe; surface densely, vaguely ocellate-punctate, and rather densely, uniformly clothed with long, semierect white and brownish yellow hairs intermixed. Scutellum very small.

Elytra slightly wider than pronotum at base, and widest at base; sides feebly rounded behind the humeral angles, slightly sinuate in front of middle, then strongly arcuately narrowed to near the tips, which are conjointly broadly rounded; humeri moderately prominent; disk without lateral carinae, but each elytron with a broad, vague basal depression, and a similar depression along lateral margin behind the humerus; surface rather densely, finely punctate, vaguely rugose, and rather densely clothed with long, semierect yellowish and reddish brown hairs intermixed, without forming any distinct design, except for a large round dark spot at the apex, common to both elytra, and where the surface is densely clothed with long, inconspicuous blackish hairs.

Beneath rather strongly convex; abdomen vaguely granulose, finely, transversely crenulate, becoming irregularly striolate on the basal segment, and sparsely clothed

with short, inconspicuous hairs. Prosternum short, abruptly declivous, the anterior margin broadly rounded and strongly margined; prosternal process strongly elevated, slightly longer than wide, narrower in front than behind, the sides feebly arcuately constricted, and the apex broadly rounded. Tarsi orange yellow, except the last joint, which is black, and the tarsal lamellae whitish.

Length, 3.25 millimeters; width, 2 millimeters.

*Type locality*.—Bettotan, North Borneo.

*Type*.—United States National Museum.

Described from a single example collected at the type locality, near Sandakan, August 22, 1927, by C. B. Kloss and H. M. Pendlebury.

This species can be easily distinguished from the other species of this genus found in Borneo, by the large, distinct dark apical spot on the elytra.

### ***Trachys oreophilus* sp. n.**

Broadly cuneiform, slightly convex, strongly expanded anteriorly, and widest near base of elytra; above violaceous blue, strongly shining, the pronotum and elytra with a more or less greenish tinge, and ornamented with whitish pubescent designs; beneath brownish black, with a vague aeneous reflection in certain lights.

Head with the front broadly, rather deeply concave between the eyes, with a vague, narrow median groove extending from the occiput to middle of front, and the two median postoral pores distinct and widely separated; surface with a few ocellate punctures on occiput and behind the epistoma, where the surface is also sparsely, irregularly clothed with recumbent whitish hairs; eyes rather strongly margined on inner side, and strongly converging toward the bottom; epistoma scarcely elevated, very short, strongly transverse between the antennae, anterior margin transversely truncate, with the exterior angles strongly produced, and the surface vaguely, transversely reticulate; clypeal suture not distinct.

Pronotum three times as wide as long at middle, much narrower at apex than base, and widest at base; sides strongly obliquely narrowed from base to apical angles (slightly sinuate near posterior angles); apical angles acute, and extending forward nearly on a line with front of head; posterior angles rather acute, but not produced backward; anterior margin broadly, deeply arcuately emarginate; base strongly, transversely sinuate, with the median lobe broadly rounded and strongly produced; disk slightly convex, broadly, but not deeply, triangularly depressed at the sides, the anterior margin of the depression extending from near the apical angles obliquely backward to the base at middle, and with a round, deep depression on each side near apical

angle; surface densely, vaguely ocellate-punctate in the depressed area, and rather densely, irregularly clothed with moderately long, recumbent white hairs, with a few brownish black hairs intermixed. Scutellum rather large and triangular.

Elytra as wide as pronotum at base, and widest just behind the base; sides vaguely rounded for a short distance behind the humeral angles, then strongly arcuately narrowed to near the tips, which are conjointly broadly rounded; humeri prominent and strongly elevated; each elytron with a strongly elevated lateral carina extending from the humeral angle to near the apical margin, with a broad, deep, transverse basal depression, and a similar depression along the lateral margin behind the humerus; surface finely, sparsely, irregularly punctate, sparsely clothed with semierect, inconspicuous black hairs, and ornamented with white pubescent designs as follows: a more or less distinct, irregular design covering the basal half, and two narrow, transverse, strongly zigzag fasciae on the apical half, each fascia forming the letter M common to both elytra, and then more or less transverse or sinuate externally to the lateral margin.

Beneath moderately convex; abdomen vaguely granulose, densely ocellate-punctate, the ocelli open posteriorly, becoming more or less rugose on the basal segment, and clothed with a few recumbent white hairs along the lateral and apical margins. Prosternum slightly declivous anteriorly, the anterior margin broadly rounded and distinctly margined; prosternal process strongly elevated, slightly wider than long, narrower in front than behind, and the sides strongly obliquely expanded to the apex, which is broadly subtruncate. Tarsi black, and the tarsal lamellae whitish.

Length, 3.25 millimeters; width, 2.2 millimeters.

*Type locality*.—Sandakan, Borneo. (Baker No. 12638).

*Other localities*.—Samawang, North Borneo.

*Type*.—United States National Museum.

*Paratype*.—Selangor Museum, Kuala Lumpur, Federated Malay States.

Described from two examples. The type collected at Sandakan, by C. F. Baker, and a paratype collected at Samawang, near Sandakan, at light, July 16, 1927, by C. B. Kloss and H. M. Pendlebury.

This species is closely allied to *praora* Obenberger. I have not seen specimens of *praora*, but from Dr. Obenberger's figure and description of that species, the pronotum is uniformly rounded from the posterior angles to the apical angles, and not sinuate near the posterior angles, the

prosternal process is distinctly longer than wide, whereas in *oreophilus* it is distinctly wider than long, and the white pubescent markings on the elytra are more irregular on the basal half, the zigzag fasciae are more transverse toward the lateral margins, and there is no distinct white pubescent spot at the apex.



## V. NOUVEAUX CERCOPIDES

de la Presqu'île Malaise

par le Dr. V. LALLEMAND, Uccle.

(with one text-figure).

[In this paper Dr. V.ALLEMAND describes a number of new Cercopids which he has found in the collection of these insects belonging to the Federated Malay States Museums. He has already described the species which he found to be new in the material belonging to the Raffles Museum, Straits Settlements (Journ. Malayan Branch, Roy. Asiat. Soc., 1, 1923, pp. 267-270).]

As an addendum to this paper Mr. H. M. Pendlebury, Entomologist, F. M. S. Museums, has drawn up a list of all the Cercopids in both the Museums, following the determinations of Dr. LALLEMAND. C. Boden Kloss].

### **Moultoniella bipars** LALLEMAND.

Journ. Malayan Branch Roy. Asiat. Soc. 1. 1923, p. 267.

♀. Abdomen, cuisses antérieures et médianes, tête, rouges ou ocre-brun clair; pronotum brun clair avec les bords latéraux et antérieur rouges ou ocre-brun clair; écusson, méso- et métasternum pattes brun plus foncé; élytres traversés au milieu par une large bande noire, immédiatement au devant de celle-ci le long du bord externe, se voit une tache ocre-jaune plus ou moins grande, puis une tache noire (externe au radius), toute la partie interne est gris-brun, sur certains exemplaires, elle peut être plus ou moins tachée de noir, partie apicale ocre-jaune transparente; ailes enfumées, à base brune; premiers segments de la face supérieure de l'abdomen d'un rouge légèrement brunâtre, traversés par une bande noire, les trois derniers entièrement noirs; ceux de la face inférieure sont brun foncé, bordés finement en arrière d'ocre-brun clair ou de rouge.

Longueur:—12 à 13 mm.

♂. Longueur: 11 mm.

De chaque côté des oranges génitaux, se trouve un long style rouge-brun plus ou moins foncé.

Habitat: Pahang, Kuala Teku, Nov. 1920, (E. Seimund.)

Other localities:—Pahang, Kuala Tahan, 350', Nov. 1921. (H.M.P.)

### **Roscarta punctata** sp. n.

Front, rostre, prosternum, pattes ocre-jaune un peu rougeâtre; vertex, pronotum ocre-jaune très légèrement brunâtre ou rougeâtre. Sont noirs: la base des antennes, la place des ocelles, de chaque côté, près du bord postérieur du vertex, une tache voisine des yeux, 6 ou 8 taches plus ou moins grandes, situées en ligne transversale dans les

fossettes du pronotum, l'extrémité du rostre, des tarses et des épines. Elytres rouges, jaune-rougeâtre sur le quart basal en dehors du radius et rose à la partie apicale. Ailes enfumées, à base jaune-rosé. Face supérieure de l'abdomen brune; face inférieure ocre-brun.

Voisine de *E. semirosea* Walker; sillon longitudinal du front commençant au bord antérieur. Nervation des élytres et des ailes pareille à celle d' *E. semirosea*, s'en distingue surtout par la base des antennes et les taches noires du vertex et du pronotum.

Longueur: 8.5 mm.

Habitat: Pahang, Cameron's Highlands, at light, No. 4 camp, 4,500 ft. (H.M. Pendlebury).

**Notoscarta malayana** sp. n.

Tête, pattes, pro-, mésosternum ocre-jaune pâle; métasternum, face inférieure de l'abdomen ocre-jaune plus ou moins brunâtre; face supérieure, abdomen brun clair; ocelles rouges; yeux rouges tachés de brun; pronotum ocre-jaune dans le quart antérieur, puis ocre-jaune-rougeâtre, en arrière une large bordure noire, s'étendant en s'amincissant le long des bords latéraux. A la fin du tiers antérieur des élytres une large bande transversale noire, dont le bord antérieur est droit et le postérieur irrégulier, toute la partie antérieure à cette bande et environ le tiers externe de la partie postérieure est rouge et opaque, le restant est ocre-jaune-brunâtre, transparent, dans cette région les nervures sont rouges; ailes enfumées, à base rouge.

Fossette du front large et assez profonde, commençant sous le bord antérieur; ocelles très proches l'un de l'autre; pronotum ponctué en stries transversales; une épine sur les tibias postérieurs; nervures des élytres bien marquées.

Longueur: 8 mm.

Habitat: Pérak (ma collection); Pahang, Kuala Teku (H. M. Pendlebury); Cameron's Highlands (M. R. Henderson).

**Phymatostetha pahangana** sp. n.

Vertex, écusson et pronotum ocre-brun; angles latéro-antérieurs et bords latéraux de la partie frontale du vertex, sur le vertex une fine ligne longitudinale externe à l'ocelle et une tache de chaque côté près du bord postérieur, ainsi que les fossettes antérieures du pronotum, noirs ou brun-noir. Elytres ocre, plus ou moins fortement tachés de brun, sur ceux-ci se voient trois ou quatre places claires (non tachées de brun), une en avant du milieu, près du bord externe et fréquemment une seconde sur le clavus au même niveau, (il peut même arriver qu'on puisse en distinguer une troisième entre ces deux premières, les deux autres toujours bien nettes, se trouvent

sur le corium, une près de la suture, au niveau de la pointe du clavus et l'autre au bord externe en face de celle-ci). Ailes brunes, à base ocre. Front et clypeus ocre-jaune sur le milieu, bruns sur les côtés; premier article du rostre ocre, second article noir; pattes ocre-jaune, avec des taches brun clair plus ou moins grandes; extrémité des épines et griffes noires; abdomen brun-noir sa base et les organes genitaux sont brun clair, voire ocre-brun.

Longueur: 22 mm.

Elytres, longueur: 18.5 mm., largeur: 6 mm., étendus: 42 mm.

Habitat: Pahang, Cameron's Highlands, at light, No. 4 camp, 4,000 ft. (H. M. Pendlebury).

*Phymatostetha semele* Stal.

Ofvers. af k. Vet.—Akad. Förh., p. 151, (1865).

var. *limbata* var. n.

Se distingue de l'espèce par le quart posterior du pronotum noir; sur les élytres, à la place de la bande postérieure ondulée, trois taches plus ou moins rondes.

Selangor-Pahang border: The Gap, 2,700 ft. Jan. 1915 (C. B. Holman-Hunt).

*Trichoscarta pendleburyi* sp. n.

Tête, pronotum, écusson, pro- et mésosternum noirs; élytres brun-noir, bordés d'ocre-brun en arrière; ailes roses ou jaune-rose, brun-noir vers l'extrémité et le bord postérieur; métasternum, rostre, pattes ocre-jaune plus ou moins brunâtre. Sont jaunes: sur la partie supérieure du front, une assez grande tache triangulaire, sur le pronotum quatre taches plus ou moins rondes disposées en ligne transversale ainsi que deux lignes sur les élytres, la première suit le bord interne jusqu'un peu en avant du milieu, de là se dirige en dedans et en arrière jusqu'au cubitus sur lequel elle donne un prolongement en arrière, ensuite elle se dirige en avant et en dehors vers le bord externe qu'elle atteint non loin de la base en donnant sur le radius un second prolongement vers l'arrière, la seconde est transversale, située au devant de la partie réticulée. Ocelles plus près l'un de l'autre que des yeux; pronotum à fine carène médiane bien nette et ponctué en stries transversales; écusson strié et à très grande fossette centrale; rostre long, s'étendant entre les hanches postérieures; protubérances du mésosternum peu saillantes, en bourrelet transversal; une épine sur les tibias postérieurs.

var. *interrupta* la première bande des élytres est interrompue entre le cubitus et le radius.

Longueur totale: 15 mm.

Longueur du corps: 10 mm.

Elytres; longueur: 12 mm., largeur: 5 mm., étendus: 25 mm.

Habitat: Pahang, Gunong Tahan, Padang Luas (4,900 -7,000 ft.), Décembre H. M. Pendlebury; Perak, Sungei Bertam, Septembre, E. Seimund.

Je dédie cette esèce à Mr. Pendlebury, du Musée de Kuala Lumpur.

***Cosmoscarta diminuta* sp. n.**

Tête, pronotum, prosternum noir-bleuâtre avec une légère teinte verte et à reflets métalliques; écusson rouge; élytres noirs, recouverts d'une villosité rousse, sur ceux-ci trois bandes rouges, une première longeant le bord interne du clavus, jusque la pointe de l'écusson, une deuxième longitudinale, subcostale, s'étendant sur le tiers basal du corium, enfin une troisième transversale au devant de la partie apicale, cette dernière peut plus ou moins s'effacer; ailes enfumés, à base rouge; mésosternum ocre-rouge, taché de brun; métasternum, abdomen et pattes ocre-rouge; sur les segments de la face inférieure de l'abdomen quatre taches noires; ornages génitaux brun clair.

Ocelles plus proches des yeux que l'un de l'autre; une épine sur les tibias postérieurs.

Fait partie du groupe de *C. cogens* Walker, s'en distingue par la taille assez petite et le dessin des élytres (bande longitudinale subcostale).

Longueur totale: 12.5 mm.

Longueur du corps: 9 mm.

Elytres, longueur: 10 mm., largeur: 4 mm.

Habitat: Selangor-Pahang, the Gap 2,700 ft; Perak, Batang Padang, Jor Camp 1,500 ft. H. M. Pendlebury.

***Leptataspis selangorensis* sp. n.**

Pronotum, écusson brun-rougeâtre, bords postérieur et latéraux du premier rouges; tête de teinte plus claire que le pronotum; élytres mordorés, brillants, à fin bord externe (jusqu'à la partie réticulée) et base du radius ocre-rouge; ailes noires à base rosée; segments de la face supérieure de l'abdomen d'un jaune noir légèrement bleuté, bordés de rouge; ceux de la face inférieure sont rouges, sur le premier segment une large bande médiane et deux taches latérales, sur le deuxième une large bande médiane, sur les troisième et quatrième deux taches sur la partie médiane, noir-rougeâtre, ces bandes et lignes peuvent plus ou moins s'effacer au point de disparaître presque complètement; sternum brun-rougeâtre; pattes, rostre d'un rouge plus ou moins vif. Pronotum à fine carène médiane, surtout marquée à la partie antérieure, fortement ponctué

en stries plus ou moins transversales; écusson transversalement strié; mésosternum à protubérances peu saillantes, en bourrelet transversal, et à bord postérieur saillant; deux épines sur les tibias postérieurs, une très petite à la base et une grande vers l'extrémité.

Longueur totale: 18 à 19 mm.

Longueur du corps: 15 mm.

Elytres, longueur: 15 mm., largeur: 4.5 mm.

Cette espèce est surtout caractérisée par la longueur des élytres par rapport à leur largeur.

Habitat: Selangor, Pahang, The Gap, 2,700 ft. janvier, 1915. C. B. Holman-Hunt.

**Leptataspis hendersoni sp. n.**

Pattes, front ocre-jaune légèrement brunâtre; rostre brun clair; vertex, pronotum brun foncé, ou brun-noirâtre; écusson, élytres, sternum, face inférieure de l'abdomen noirs; ailes noires à nervures noires; face supérieure de l'abdomen noir-bleuâtre; ocelles jaune clair, très gros, plus près l'un de l'autre que des yeux.

Pronotum brillant, très légèrement ridé, finement ponctué, à carène médiane seulement indiquée dans la partie antérieure et quelque peu en arrière du bord antérieur, à bord postérieur convexe, arrondi; médian et cubitus réunis en un tronc commun sur un trajet assez court sur partie antérieure du corium; bord postérieur du mésosternum foliacé, protubérances en cône aplati, transversales, dirigées en avant et en bas;

Cette espèce est remarquable par la grosseur des ocelles.

Longueur totale: 20 mm.

Longueur du corps: 13 mm.

Elytres, longueur: 16 mm., largeur: 5, 5 mm., étendus: 36 mm.

Habitat: Pahang, Cameron's Highlands, Tanah Rata, 4,500 à 4,800 ft. (M. R. Henderson.)

Je dédie cette espèce à Mr. Henderson qui l'a recoltée.

**Leptataspis ophirina sp. n.**

Tête, pronotum, prosternum d'un noir-bleuâtre, brillants; écusson noir; élytres rouges, un large bord externe, l'extrémité du clavus, et une bande transversale noirs, cette bande part du bord externe un peu en avant du milieu et s'étend plus ou moins loin vers le bord interne, elle peut se réunir à la partie noire du clavus; la partie apicale réticulée du corium peut varier dans sa coloration, du noir au brun plus ou moins foncé, les nervures y sont

pour la plupart rouges; ailes enfumées, à nervures noires, à base rouge; méso- et métasternum, rostre, pattes rougeâtres; abdomen rouge.

Ocelles à peu près à égale distance l'un de l'autre et des yeux; pronotum assez densément ponctué en lignes plus ou moins transversales non ridé, ayant une fine carène longitudinale; sur les tibias postérieurs une forte épine au commencement du tiers apical. Se distingue de *L. ophir* Distant, par la taille et la coloration.

Longueur: 9.5 à 10 mm.

Longueur des élytres: environ 8 mm.

Habitat: Negri Sembilan, Gunong Angsi. Ex. Coll. Agric: Dept:

***Homalostethus humilis* sp. n.**

Tête et pronotum ocre-jaune légèrement brunâtre, côtés du second plus clairs; écusson brun-noirâtre; élytres ocre-jaune ayant une tache noire entre le médian et le radius, au devant de la bifurcation de ce dernier; ailes légèrement enfumées, à nervures foncées; face supérieure de l'abdomen noir-bleuté, face inférieure et pattes ocre-jaune; sternum noir brillant; tarses et épines noirs. Rostre court, s'étendant à peine jusqu'au milieu des protubérances, celles-ci sont aplaties, transversales; pronotum ponctué en stries transversales, à carène bien marquée dans la partie antérieure, mais ne s'étendant pas jusqu'au bord postérieur.

Longueur totale: 10.5 mm.

Longueur du corps: 9 mm.

Elytres, longueur: 8 mm., largeur: 3 mm. étendus: 20 mm.

Habitat: Pahang, Wray's Hill, Gunong Tahan, 2,000-2,500 ft., Novembre, (H. M. Pendlebury.)

***Opistharsostethus sexpunctatus* sp. n.**

Tête, pronotum, écusson, pattes d'un rouge légèrement brunâtre; élytres ocre-jaune rougeâtre, partie apicale un peu brunâtre, sur ceux-ci six taches jaunes disposées comme chez *O. javanensis* Schmidt sur trois rangs, la première rangée comprend deux taches, la deuxième, trois et la dernière, une; la première se compose d'une grande, transversale, située à la fin du tiers basal et d'une plus petite sur le milieu du clavus; la deuxième rangée, légèrement en arrière du milieu, est formée d'une tache transversale, voisine du bord costal, d'une plus petite proche de la pointe du clavus et d'une petite à l'extrémité de la nervure anale externe; la sixième tache se trouve au devant du réseau de la partie apicale entre les branches du radius. Ailes jaune-orange, à nervures un peu plus foncées et à base rougeâtre. Premier segment de la face supérieure de l'abdomen rouge-brunâtre avec une bande

transversale noire vers le bord postérieur, deuxième, rouge-brunâtre, troisième de même couleur avec trois taches noires, une petite médiane ronde et deux grandes latérales transversales, quatrième, cinquième et sixième, noirs avec une bordure latérale et postérieure rouge-brunâtre; dernier segment et organes génitaux rouge-brunâtre; à la face inférieure, les segments sont noirs, bordés de rouge légèrement brunâtre sur les côtés et en arrière; rostre, sternum, cuisses postérieures (sauf leur extrémité), extrémité des tibiae antérieurs, tarses antérieurs, extrémité des épines et des griffes noirs.

Ocelles petits, légèrement plus près des yeux que l'un de l'autre; pronotum à carène médiane bien marquée en avant, n'atteignant pas le bord postérieur, finement strié transversalement, à angles latéraux prééminents, arrondis, à bords latéro-postérieurs relevés et légèrement concaves, bord postérieur très légèrement convexe et arrondi. Ecusson transversalement strié, recouvert en grande partie par le pronotum. Bord postérieur du mésosternum aplati et saillant, protubérances saillantes, aplaties, dirigées en bas et en avant. Rostre court, s'étendant à peine jusque' entre les protubérances.

Longueur du corps: 20 mm.

Elytres, longueur: 20 mm., largeur: 7 mm., étendus: 50 mm.

Habitat: Perak, Batang Padang, Jor Camp 1,500 ft. recueilli en juin 1923 par Mr. H. M. Pendlebury.

***Opistharsostethus tripunctatus* sp. n.**

Tête, pronotum, écusson, élytres, pattes, rostre ocre-jaune; sur le corium trois taches noires disposées comme celles de *O. simulans* Schmidt (celle du clavus ayant disparu). Ailes jaunes à base rosée. Segments abdominaux postérieurement et latéralement bordés de brun clair, le dernier et les organes génitaux ocre-brun; sternum noir.

Pronotum densément ponctué en stries plus ou moins transversales, à fine carène longitudinale ne s'étendant pas jusqu'au bord postérieur, à angles latéraux arrondis, à bord postérieur fortement arrondi. Ecusson en grande partie recouvert par le pronotum. Protubérances du mésosternum aplaties d'avant en arrière, bord postérieur saillant.

Longueur: 19 mm.

Elytres, longueur: 16 mm., largeur: 6 mm., étendus: 37 mm.

Habitat: Kedah Peak; Pahang, Cameron's Highlands 4,000 ft. (H. M. Pendlebury).

**Opistharsostethus malayanus sp. n.**

Tête, pronotum, écusson, élytres ocre-jaune légèrement brunâtre; élytres ayant quatre taches disposées comme celles de *O. simulans* Schmidt; ailes jaunes, à base rosée; face supérieure de l'abdomen brun clair, les deux premiers segments légèrement estompés de noir par places, les quatrième et cinquième portant une large bande noire médiane; à la face inférieure les trois premiers segments sont noirs, bordés de rouge en arrière et sur les côtés, les autres sont d'un rouge légèrement brunâtre; pattes ocre-jaune quelque peu rougeâtre; sternum noir, brillant.

Ocelles légèrement plus distants l'un de l'autre que des yeux; pronotum bombé, portant une carène médiane bien nette, saillante, ponctué en stries plus ou moins transversales; angles latéraux saillants, arrondis, mais moins que chez *O. globosicollis* Schmidt, bords latéro-postérieurs concaves, bord postérieur à peu près droit; protubérances du mésosternum peu saillantes, bord postérieur de ce dernier saillant.

Cette espèce se distingue de *O. globosicollis* par les angles latéraux du pronotum et de *O. quadripunctatus* Schmidt, par la distance des ocelles l'un de l'autre.

Longueur totale: 20 mm., longueur du corps: 16 mm.

Elytres, longueur: 16 mm., largeur: 6 mm., étendus: 42 mm., largeur du pronotum: 10 mm.

Habitat: Péninsule malaise: Kedah Peak, Gurun, Kedah: Gunong Angsi, Negri Sembilan.

**Ectemnonotum apicale sp. n.**

Tête, pronotum, prosternum, écusson d'un noir légèrement bleuté, métallique; élytres d'un noir un peu brunâtre et à nervures apicales rougeâtres; ailes brun-noir; abdomen brillant, à la face supérieure bleu-violet, et l'inférieure noir-bleuâtre; rostre, méso- et métasternum, pattes d'un brun plus ou moins rougeâtre. Ocelles gros, très légèrement plus près des yeux que l'un de l'autre; pronotum peu brillant, ponctué en stries transversales, légèrement ridé, à carène médiane longitudinale; rostre s'étendant jusqu'au milieu des hanches médianes, tibias postérieurs ayant deux épines, une petite à la base et une forte au delà du milieu.

Longueur totale: 18.5 mm.

Longueur du corps: 13.5 mm.

Longueur des élytres: 16 mm.



Habitat: Perak, Batang Padang, Jor Camp. 2,000 ft. (E. Seimund.)

**Ectemnonotum kedahanum** sp. n.

Tête, pronotum, sternum de couleur acajou plus ou moins foncée; écusson noir; élytres noirs, brillants, ayant une légère teinte acajou surtout marquée vers l'extrémité; surface supérieure du corps recouverte d'une villosité rousse; pattes brun-acajou ou rougeâtres; ailes enfumées, à base rougeâtre et à nervures noires; face supérieure de l'abdomen bleu-violet, face inférieure noire, brillante.

Ocelles plus près des yeux que l'un de l'autre; pronotum très brillant lisse, à ridés transversale, peu marquées très finement et densément ponctué, à carène longitudinale nette, surtout marquée à la partie médiane; écusson plus long que large à stries transversales; sillon médian du front large et bien marqué.

Longueur: 16 mm.

Elytres, longueur: 13 mm., largeur: 4.5 mm.

Habitat: Péninsule malaise: Kedah Peak, 3,000 ft.

**Ectemnonotum coruscans** sp. n.

Front, pronotum, vertex, bleu-violet, très brillant; écusson bleu-verdâtre; la partie médiane et tout à fait antérieure du pronotum a des reflets verdâtres; rostre, méso- et métasternum brun-rougeâtre à reflets verdâtres; extrémité des protubérances et pattes rouges; griffes et extrémité des épines noires; partie supérieure de l'abdomen noire à reflets verts et bleus; ailes noires, à nervures noires; élytres noir-verdatre, à bord externe et nervures de la partie apicale rouges; ocelles jaune pâle; toute la surface supérieure de l'insecte est très brillante, spécialement le pronotum.

Ocelles petits, plus près de yeux que l'un de l'autre, pronotum à fine ponctuation, à carène médiane, peu saillante; écusson transversalement strié, à grande fossette médiane; deux épines sur les tibias postérieurs, une petite à la base et une grande vers l'extrémité.

Longueur: 15 mm.

Elytres, longueur: 12 mm., largeur: 4 mm.

Habitat: Selangor Pahang, The Gap 2,700 ft.

**Genus Gynopygocarta** gen. nov.

Tête, pronotum, écusson de même forme que ceux du genre *Ectemnonotum* Schmidt; élytres et ailes semblables à ceux de *Gynopygoplas* Schmidt, diffère de ces genres par la forme des protubérances et du bord postérieur du mésosternum, qui ressemblent à ceux du genre *Simeliria* Schmidt, mais le bord postérieur foliacé est moins haut que les protubérances.



Fig. 1. Protubérances et bord postérieur du mésosternum de *Gynopygocarta*.

Type du genre: *G. butleri* Distant.

***Gynopygocarta butleri* Distant.**

Trans. Ent. Soc. Lond. p. 667 (1900) (*Cosmoscarta*).

Mr. E. Schmidt, p. 288, Stett. entomol. Zeit. (1909), sans avoir vu d'exemplaire de cette espèce la place dans le genre *Simediria*, se basant sans doute sur des similitudes de coloration, la description de Distant ne donnant aucun détail au sujet de la forme du bord postérieur du pronotum, des élytres, des protubérances et du bord postérieur du mésosternum. Mr. China du British Museum avec son amabilité coutumière a bien voulu comparer un de mes exemplaires avec le type de Distant et j'ai pu ainsi rectifier la position de cet insecte.

VI. MALAYSIAN CERCOPIDAE IN THE RAFFLES  
AND FEDERATED MALAY STATES MUSEUMS.

By H. M. PENDLEBURY.

Family CERCOPIDAE.

Subfamily MACHAEROTINAE.

Genus *Hindola* Kirk.

*H. sumatrensis* Schmidt.

*Modiglianella sumatrensis* Schmidt.

Selangor: Kuala Lumpur, September 10th 1922;  
Dusun Tua, July 30th, 1921 (H. M. Pendlebury); Bukit  
Cherakah Forest Reserve, June 1921 (H. C. Abraham).

Subfamily APHROPHORINAE.

Genus *Poophilus* Stal.

*P. costalis* Wlk.

Selangor: Kuala Lumpur, March 1915, February  
1919.

Genus *Clovio* Stal.

*C. bipars* Wlk.

Perak: Batang Padang, Jor Camp, 1,800 ft. (F. N.  
Chasen).

Selangor: Kuala Lumpur, 21st mile Gombak Valley,  
October 22nd, 1921 (H. M. Pendlebury).

*C. conifera* Wlk.

Peninsular Siam: Nakon Sri Tamarat, Khao Ram,  
600-700 ft., February 24th, 1922.

Malay States: West Coast, Langkawi Is., April, May,  
1928.

Kedah: Catchment area, near Jitra, April 1928.

Selangor: Kuala Lumpur, June 1921, September 1922,  
(all H. M. Pendlebury).

Perak: Taiping, December 1923 (M. R. Henderson).

Singapore: Cavanagh Road, October 1913 (V. Knight).

*C. penskyi* Schm.

Pahang: Lubok Tamang 3,500 ft., at light, June 11th,  
1923 (H. M. Pendlebury).

Genus *Perinoia* Wlk.

*P. suppressa* Wlk.

Peninsular Siam: Nakon Sri Tamarat, Khao Ram,  
750-1,200 ft., February 25th, 1922 (H. M. Pendlebury).

Genus *Thoodzata* Dist.

*T. princeps* Dist.

Pahang: Lubok Tamang, 3,500 ft., June 8th, 1923  
(H. M. Pendlebury).

Genus *Plinia* Stal.**P. ampla** Wlk.

Penang Hill, 1,500–2,400 ft., May 1917.

Perak: Gunong Kledang, 2,650 ft., November 1916 (R. Hanitsch).

Selangor–Pahang border, the Gap, 2,700 ft., March 1912.

Negri Sembilan: Gunong Angsi, 2,000–2,700 ft., April 1918 (R. Hanitsch).

**P. punctipennis** Schm.

Perak: Gunong Kledang, 2,650 ft., November 1916 (R. Hanitsch).

**P. marginalis**

Peninsular Siam: Nakon Sri Tamarat, Khao Ram, 750 ft., February 24th, 1922 (H. M. Pendlebury).

Selangor–Pahang border, the Gap, 2,700 ft., January 1915 (C. B. Holman-Hunt).

Selangor: Bukit Kutu, September 1910. Kuala Lumpur, Cheras Road, 7th mile, October 1922 (H. M. Pendlebury).

Genus *Moultoniella* Lall.**M. bipars** Lall.

Sarawak: Madalam, February 1915 (H. W. Smith, Type ♂).

Selangor: Bukit Kutu, 3,450 ft., April 1915.

Selangor–Pahang border, the Gap, 2,700 ft., January 1915 (C. B. Holman-Hunt).

Pahang: Kuala Tahan, 350 ft., November 25th, 1921 (H. M. Pendlebury); Kuala Teku, 500 ft., August–November 1920 (Type ♀), December 3rd, 7th, 1921 (H. M. Pendlebury).

## Subfamily CERCOPINAE.

Genus *Considia* Stal.**C. nitidula** Bredd.

Perak: Batang Padang, Jor Camp, 1,800 ft., June 1923 (F. N. Chasen), May 31st, June 1st, 2nd, 30th, 1923 (H. M. Pendlebury).

Selangor: Gombak Valley, 21st mile, October 15th, 1921; Sungei Buloh Forest Reserve, 13th mile, September 17th, 1922 (H. M. Pendlebury); Ginting Bidai, 2,000 ft. (C. B. Kloss).

**C. immaculata** Schm.

Sarawak: Baram, September 22nd, 1920 (J. C. Moulton).

Genus *Callitettix* Stal.*C. versicolor* F. var. *approximans* Wlk.

Peninsular Siam: Nakon Sri Tamarat, Khao Rom-pibun, March 1st, 1922, Khao Ram, 300–750 ft., February 22nd–27th, 1922 (H. M. Pendlebury); Trang, Ban Chong, April 21st–May 16th, 1924 (I. H. N. Evans).

Malay States: West Coast, Langkawi Is., April 15th–27th, 1928 (H. M. Pendlebury).

Genus *Eoscarta* Bredd.*E. linternoides* Bredd.

Peninsular Siam: Nakon Sri Tamarat, Khao Ram, 750–2,000 ft., February 25th, March 2nd, 1922; Khao Luang, 2,000 ft., March 9th–22nd, 1922 (H. M. Pendlebury); Trang, Ban Chong, May 16th, 1924 (I. H. N. Evans).

Malay States: Selangor, Gombak Valley, 21st mile, October 12th–25th, 1921; Bukit Kutu, at light, 3,500 ft., April 13th, 1926 (H. M. Pendlebury); The Gap, 2,700 ft., March 1921.

Malacca, Rim, February 1908 (C. B. Holman-Hunt).

Malacca–Johore border, Mt. Ophir foothills N. W., 200–1,300 ft., October 1920 (H. C. Abraham).

Pahang: Cameron's Highlands, Tanah Rata, 4,800 ft., March 11th, 1924 (H. M. Pendlebury).

*E. punctata* Lall.

Pahang: Cameron's Highlands, 4,800 ft., Tanah Rata, October 15th, 1923, H. M. Pendlebury; Same locality, January 18th–31st, 1924 (M. R. Henderson).

*E. roseinervis* Schmidt.

Selangor: Kuala Lumpur, 21st mile, Gombak Valley, October 11th, 1921 (H. M. Pendlebury).

*forma major* Lall.

Pahang, Lubok Tamang, 3,500 ft., at light, June 7th, 1923 (H. M. Pendlebury).

*E. eos* Bredd.

Perak: Batang Padang, Jor Camp, 1,800 ft., May 29th–June 16th, 1923 (H. M. Pendlebury).

Selangor: Ginting Bidai, 2,000 ft. (C. B. Kloss).

Genus *Notoscarta*.*N. malaya* Lall. sp. n.

Pahang: Kuala Teku 500 ft., December 3rd, 1922 (H. M. Pendlebury. Type).

Genus *Trichoscarta* Bredd.**T. centrodes** Jacobi.

Selangor: Bukit Kutu, 3,500 ft., April 1915.

**T. chersonesia** Dist.

Perak: Batang Padang, Jor Camp, 1,800 ft., June 1st-6th, 1923 (H. M. Pendlebury); June 1923 (F. N. Chasen).

Selangor: The Gap, 2,700 ft., January 1915; Bukit Kutu, 3,500 ft., April 1915.

**T. roborea** Dist.

Perak: Batang Padang, Jor Camp, 1,800 ft., January 21st, 1925 (H. M. Pendlebury).

**T. pendleburyi** Lall. sp. n.

Pahang: Gunong Tahan, Padang Luas, 4,900 ft., December 31st, 1922 (Type). Same locality 5,500 ft., December 17th, 1921; Gunong Tahan, 600-7,000 ft., December 25th, 1922 (H. M. Pendlebury).

Sungei Bertam, 4,800 ft., September 3rd, 1922 (E. Seimund).

**var. interrupta** Lall. var. n.

Pahang: Gunong Tahan, 6,500 ft., December 13th, 1921 (H. M. Pendlebury).

Gunong Benom, 6,500 ft., July 26th, 1925 (I. N. H. Evans).

Genus *Cosmocarta* Stal.**C. dimidiata** (Dallas).

Peninsular Siam: Nakon Sri Tamarat, Khao Tong, 300 ft., February 21st, 1922; Khao Ram, 750 ft., February 27th, 1922 (H. M. Pendlebury).

Malay States, Selangor: Kanching Forest Reserve, October 22nd, 1922; Gombak Valley, October 15th-21st, 1921 (H. M. Pendlebury).

Pahang, Kuala Tahan, November 23rd, 1921 (F. N. Chasen).

Johore, Kota Tinggi, August 1917, Singapore, Bukit Timah, October 8th, 1919; Pulau Ubin, September 26th, 1921 (F. N. Chasen).

**var. affinis** Atk.

Selangor: Kuala Lumpur, July 8th, 1921 (H. M. Pendlebury).

**var. discrepans** Wlk.

Selangor: Gombak Valley, 21st mile, October 16th, 1921 (H. M. Pendlebury).

The Gap, 2,700 ft., January 1915; Ginting Bidai, 2,000 ft. (C. B. Kloss).

Pahang: Tras, August 15th, 1907 (R. Hanitsch).

Malacca-Johore border, Lubok Kedondong, foothills N. W. of Mt. Ophir, 200 ft. November 1920 (H. C. Abraham); Johore, Kota Tinggi, August, 1917; Singapore, Bukit Timah, August 2nd, 1913 (R. Hanitsch).

var. *impunctata* Lall. var. n.

Peninsular Siam: Nakon Sri Tamarat, Khao Kas, 300 ft., February 21st 1922 (H. M. Pendlebury. Type).

*C. diminuta* Lall. sp. n.

Selangor-Pahang border, The Gap, 2,700 ft., January, 1915 (C. B. Holman-Hunt. Type).

*C. parva* Lall. sp. n.

Selangor-Pahang border, The Gap, 2,700 ft., November 1924 (H. M. Pendlebury. Type).

Genus *Homalostethus* Schmidt.

*H. parvus* Lall.

Kedah: Gurun, December 1915 (type); Kedah Peak, 3,500 ft., December 1st, 1915 (H. C. Robinson and C. B. Kloss).

*H. humilis* (Lall.).

Kedah: Gurun, November 1915 (Type); Kedah Peak, 3,500 ft., November 30th and December, 1915 (H. C. Robinson and C. B. Kloss).

Peninsular Siam: Nakon Sri Tamarat, Khao Luang, 2,000 ft., March 16th, 1922 (H. M. Pendlebury).

Pahang: Gunong Tahan, Wray's Hill, 2,000-2,500 ft., November 26th 1922 (H. M. Pendlebury).

Selangor: Bukit Kutu, 3,500 ft., April 30th, 1926 (H. M. Pendlebury).

Genus *Gynopygocarta* Lall. Gen. n.

*G. butleri* (Dist.).

Perak: Maxwell's Hill, 4,000 ft., August 22nd, 1908 (R. Hanitsch).

Selangor-Pahang border, The Gap, 2,700 ft., January, 1915 (C. B. Holman-Hunt).

Selangor: Bukit Kutu, 3,500 ft., April 14th, 1926 (H. M. Pendlebury).

Genus *Gynopygolax* Schmidt.

*G. submaculata* Wlk.

Peninsular Siam: Nakon Sri Tamarat, Khao Luang, 2,000-2,500 ft., March 1922 (H. M. Pendlebury).

Kedah: Gurun, December 1915.

Perak: Temangoh; Batang Padang, Jor Camp, 1,800 ft., May 1923 (H. M. Pendlebury).

Maxwell's Hill, 2,150 ft., April 1904 (R. Hanitsch).

Genus *Phymatostetha* Stal.**P. borneensis** Btlr.

Penang Hill, 2,500 ft., April 1918 (J. C. Moulton), May 1917.

Malay States, W. Coast: Langkawi Is., April 19th, 1928.

Perak: Batang Padang, Jor Camp, 1,800 ft., June 1923.

Pahang: Kuala Tahan, 300 ft., November 1921 (all H. M. Pendlebury).

Kuala Lipis, August 1918 (J. C. van Langenburg).

Selangor-Pahang border, The Gap, 2,700 ft., January 1915.

Sarawak: Baram River, Lio Matu, October 1920 (J. C. Moulton).

**P. stellata** Guer.

Peninsular Siam: Nakon Sri Tamarat, Khao Ram, 1,500-3,000 ft., February, March 1922; Khao Luang, 2,000 ft., March 1922.

Kedah, Catchment Area near Jitra, April 1928 (all H. M. Pendlebury).

Perak: Gunong Kledang, 2,646 ft., November 1916 (R. Hanitsch).

Selangor-Pahang border, The Gap 2,700 ft., March 1921 (C. B. Holman-Hunt).

Selangor: Bukit Kutu, 3,400 ft., April 1915.

Negri Sembilan: Gunong Angsi, February 1920 (C. B. Holman-Hunt).

North Borneo: No other data.

**var. obliterata** Lall.

Pahang: Kuala Tahan, March 1921.

**P. dorsimacula** Wlk.

Selangor: Bukit Kutu, 3,500 ft., April 1915 (R. Hanitsch), April 1926 (H. M. Pendlebury).

**P. semele** Stal.

Selangor-Pahang border, The Gap, 2,700 ft., March 1912 (R. Hanitsch).

Selangor: Bukit Kutu, 3,450 ft., April 1928 (H. M. Pendlebury).

**var. limbata** Lall. *var. n.*

Selangor-Pahang border, The Gap, 2,700 ft., January 1915 (C. B. Holman-Hunt. Type).

Perak: Batang Padang, Jor Camp, 1,800 ft., August 1922 (E. Seimund).

**P. circumdata** Wlk.

Kedah Peak, 3,200 ft., December 1915 (H. C. Robinson and C. B. Kloss).



***P. dislocata* Wlk.**

Kedah: Catchment Area near Jitra, April 1928 (H. M. Pendlebury).

Selangor: Ginting Bidai, 2,000 ft. (C. B. Kloss).

Singapore: No other data.

***P. selangorina* Lall.**

Selangor: Bukit Kutu, 3,400 ft., April 1915 (Type).

Selangor-Pahang border, The Gap, 2,700 ft., March 1912, March 1921.

***P. hilaris* Wlk.**

Peninsular Siam: Rompibun, March 8th, 1922 (H. M. Pendlebury).

***P. pahangana* Lall. sp. n.**

Pahang: Gunong Tahan, Seat Point, 5,470 ft., December 13th, 1922 (H. M. Pendlebury); Gunong Benom, 6,000 ft., August 1925 (I. H. N. Evans); Cameron's Highlands, 4,800 ft., October-November 1923, March 1924 (H. M. Pendlebury); January 1924 (M. R. Henderson).

**Genus *Ectemnonotum* Schmidt.*****E. bivittatum* Lep. & Serv.**

Perak: Taiping, July 1st, 1915; Selangor: Bukit Kutu, 500-1,000 ft., April 21st, 1926 (H. M. Pendlebury).

***E. breviostrum* Schmidt.**

Kedah: Kedah Peak, 3,200 ft., December 1915 (H. C. Robinson and C. B. Kloss).

"North Borneo."

***E. nigrum* Atk.**

Peninsula Siam: Nakon Sri Tamarat, Ronpibun, March 4th, 8th, 1922; Khao Ram, 1,200 ft., February 26th, 1922 (H. M. Pendlebury).

***E. atrum* Lall.**

Sarawak: Matang, March 13th, 1912.

***E. apicale* Lall. sp. n.**

Perak: Batang Padang, Jor Camp, 1,800 ft., August 27th, 1922 (E. Seimund. Type).

Selangor-Pahang border, The Gap, 2,700 ft., January 1915.

***E. coruscans* Lall. sp. n.**

Selangor-Pahang border, The Gap, 2,700 ft., January 1915 (Type).

***E. kedahanum* Lall. sp. n.**

Kedah Peak, 3,000 ft., November-December 1915 (H. C. Robinson and C. B. Kloss. Type).

Genus *Opistharsostethus* Schmidt.**O. octopunctatus** Amy. & Serv.

E. Java: Ongop Ongop, June 1916 (H. C. Robinson).

**O. simulans** Schmidt.

Malay Peninsula: No other data.

**O. globosicollis** Schmidt.

Kedah: Catchment Area near Jitra, April 7th, 1928 (H. M. Pendlebury).

Gurun, December 1915 (H. C. Robinson and C. B. Kloss).

Perak: Batang Padang, Jor Camp, 1,800 ft., March 13th, 1924 (H. M. Pendlebury).

Singapore: Botanic Gardens, December 26th, 1922.

Sarawak: Baram, September 13th, 1920 (J. C. Moulton).

**O. bimaculatus** Schmidt.

Johore: Mt. Ophir, August 1905 (R. Hanitsch).

**O. bipunctatus** Lall.

Pahang: Cameron's Highlands, 4,800 ft., March 1924 (H. M. Pendlebury).

**O. sexpunctatus** Lall.

Perak: Batang Padang, Jor Camp, 1,800 ft., June 4th, 1923 (H. M. Pendlebury).

**O. malayanus** Lall.

Kedah: Kedah Peak, 3,500 ft., November 30th, 1915 (H. C. Robinson and C. B. Kloss).

Genus *Simeliria* Schmidt.**S. hippodamia** Bredd.

Selangor-Pahang border, The Gap, 2,700 ft., March 1912, January 1915.

Perak: Gunong Kledang, 2,646 ft., November 1916 (R. Hanitsch).

**S. viridicans** Guer.

Negri Sembilan: Gunong Angsi, 2,000-2,700 ft., April, 1918 (R. Hanitsch).

E. Java: Ongop Ongop, June 1916 (H. C. Robinson).

**S. cambodjiana** Schmidt.

Peninsular Siam: Nakon Sri Tamarat, Khao Kas, 300 ft., February 21st, 1922 (H. M. Pendlebury).

Selangor-Pahang border, The Gap, 2,700 ft., January 1915.

Singapore: No other data.

**S. funeralis** Btlr.

Kedah: Kedah Peak, 3,000 ft., November-December 1915 (H. C. Robinson and C. B. Kloss).

Genus *Suracarta* Schmidt.*S. tricolor fasciata* Schmidt.

Perak: Batang Padang, Jor Camp, 1,800 ft., June, 1923, March, 1924 (H. M. Pendlebury); Taiping, December 1923 (M. R. Henderson).

Pahang: Kuala Teku, 500 ft., December 1922 (H. M. Pendlebury).

var. *evanescens* Schm.

Pahang: Gali, Raub, December 1918 (R. Hanitsch).

var. *tenuipunctata* Lall.

Selangor: No other data.

var. *perakana* Schm.

Perak: Batang Padang, Jor Camp, 1,800 ft., May, June, 1923, March 1924 (H. M. Pendlebury); Maxwell's Hill, 3,000–4,000 ft., April 1904, August 1908 (R. Hanitsch).

Maxwell's Hill, 3,000–4,000 ft., April 1904, August 1908 (R. Hanitsch).

Pahang: Tras, August 1907 (R. Hanitsch).

Selangor–Pahang border, The Gap, 2,700 ft., March 1912 (R. Hanitsch), January 1915 (C. B. Holman-Hunt).

Selangor: Bukit Kutu, foot of hill, April 1915 (R. Hanitsch).

var. *niasensis* Schm.

Kedah: Kedah Peak, 3,000 ft., November–December 1915 (H. C. Robinson and C. B. Kloss).

Pahang: Tras, August 1907 (R. Hanitsch).

Selangor–Pahang border, The Gap, 2,700 ft., March 1912 (R. Hanitsch), January 1915 (C. B. Holman-Hunt).

var. *quadripunctata* Schm.

Malay Peninsula: Without other definite data.

*S. tricolor rufroplagiata* Schm. var. *quadripunctata* Schm.

Kedah Peak, 3,000 ft., December 1915 (H. C. Robinson and C. B. Kloss).

Sarawak: Kuching, 1912.

*S. tricolor basinota* Btlr.

Perak: Batang Padang, Jor Camp, 1,800 ft., 1923 (H. M. Pendlebury), June 1923 (F. N. Chasen).

Singapore:

N. Borneo: Sandakan. Sarawak: Kuching.

*S. tricolor borneensis* Schm.

Sarawak: Baram River, Lio Matu, October 1920; Saribas, August 1922 (J. C. Moulton).

Genus *Leptataspis* Schm.**L. selangorensis** Lall.

Selangor-Pahang border, The Gap, 2,700 ft., January 1915 (C. B. Holman-Hunt).

**L. formosula** Schm.

Perak (C. Wray).

**L. fortunata** Schm.

Sarawak: Baram River, Leppu Aga, October 1920 (J. C. Moulton).

**L. chryseis** Bredd.

Perak: Maxwell's Hill, 3,500-4,400 ft., April 1904, August 1908 (R. Hanitsch).

Batang Padang: Jor Camp, 1,800 ft., September 1922 (E. Seimund), May, June 1923 (H. M. Pendlebury).

Pahang: Cameron's Highlands, 4,800 ft., June 1923 (H. M. Pendlebury), January 1924 (M. R. Henderson), March 1924 (H. M. Pendlebury).

Selangor-Pahang border, The Gap, 2,700 ft., January 1915 (C. B. Holman-Hunt).

**L. moultoni** Lall.

Peninsular Siam: Nakon Sri Tamarat, Khao Kas, 300 ft.; Khao Ram, 1,200 ft.; Khao Luang, 2,000 ft., February-March, 1922 (H. M. Pendlebury); Khao Rompibun Khao Tong, March 1922 (nat. coll.).

Kedah: Kedah Peak, 3,000 ft., December 1915; Gurun, December 1915 (H. C. Robinson and C. B. Kloss).

**L. fulviceps** Dall.

Peninsular Siam: Nakon Sri Tamarat, Khao Luang, March 23rd, 1922 (H. M. Pendlebury).

**L. fuscipennis** Lep. & Serv.

Perak: Batang Padang, Jor Camp, 1,800 ft., May, June 1923, March 1924 (H. M. Pendlebury).

Selangor-Pahang border, The Gap, 2,700 ft., March 1912 (R. Hanitsch), January 1915 (C. B. Holman-Hunt).

**L. guttata** Lep. & Serv.

Perak: Maxwell's Hill, 3,000 ft., June-July 1916 (C. B. Kloss).

Batang Padang, Jor Camp, 1,800 ft., June 1923 (F. N. Chasen).

**L. helena** Bredd.

Perak: Batang Padang, Jor Camp, 1,800 ft., September 1922 (E. Seimund); June 1923 (F. N. Chasen); March 1924, March 1925 (H. M. Pendlebury).

Selangor-Pahang border, The Gap, 2,700 ft., January 1915 (C. B. Holman-Hunt).

**L. ophir** Dist.

Penang Id., 1,500–2,400 ft., May 1917 (R. Hanitsch).

Perak: Maxwell's Hill, 3,600–4,100 ft., April 1904, August 1908 (R. Hanitsch); Batang Padang, Jor Camp, 1,800 ft., May, June, 1923, March 1924, March 1925 (H. M. Pendlebury), June 1923 (F. N. Chasen).

Pahang: Cameron's Highlands, 4,800 ft., June 1923 (H. M. Pendlebury).

Selangor–Pahang border, The Gap, 2,700 ft., January 1915 (C. B. Holman-Hunt).

Selangor: Bukit Kutu, 3,500 ft., April 1926 (H. M. Pendlebury).

**L. scabra** Dist.

Perak: Batang Padang, Jor Camp, 1,800 ft., September 1922 (E. Seimund); May, June, 1923, March 1924 (H. M. Pendlebury).

Selangor–Pahang border, The Gap, 2,700 ft., June 1915 (C. B. Holman-Hunt).

**L. similis** Schm.

Sumatra: Medan, September 1921 (Mrs. Horton).

**L. sumatrana** Schm.

Sumatra: Medan, September 1921 (Mrs. Horton).

**L. medanensis** Lall.

Sumatra: Medan, September 1921 (Mrs. Horton).

**L. perakensis** Lall.

Perak: Maxwell's Hill, 3,570 ft., April 10th, 1904 (Type) (R. Hanitsch); Batang Padang, Jor Camp, 1,800 ft., August 1922 (E. Seimund); May 1923 (H. M. Pendlebury); June 1923 (F. N. Chasen).

Pahang: Lubok Tamang, 3,500 ft., June 1923 (H. M. Pendlebury); Cameron's Highlands, Gunong Berumban, 6,050 ft., June 1923 (H. M. Pendlebury); January 1924 (M. R. Henderson).

Selangor–Pahang border, The Gap, 2,700 ft., January 1915 (C. B. Holman-Hunt).

**L. ophirina** Lall. sp. n.

Malay Peninsula: No other data (Type).

**L. hendersoni** Lall. sp. n.

Pahang: Cameron's Highlands, 4,800 ft., at light, January 29th, 1924 (M. R. Henderson. Type).

## VII. DIPTERA CALYPTRATAE OF THE FEDERATED MALAY STATES.

(Third Paper.)\*

By J. R. MALLOCH, WASHINGTON, D.C., U.S.A.

(Text-figures 1-21)

Family TACHINIDAE.

Tribe Phasiini.

Below I describe a remarkable new genus of this tribe in which the characters readily distinguish it from any other in the tribe from any portion of the world.

Genus *Tetrapteromyia* gen. nov.

*Generic characters.*—Distinguished from all genera of the tribe by the exceedingly large lower calypter, the area of which is about as great as that of dorsum of thorax including the scutellum (fig. 1a). The peculiar forward prolongation of this calypter (fig. 1c) is unique, and the open first posterior cell of the wing (fig. 1b) is quite rare in the tribe. Head broader than high when seen from in front; frons of male wider than third antennal segment, orbits setulose to bases of antennae, without lateral hairs; parafacials and cheeks almost invisible in profile, antennae descending to below middle of face, eyes slightly emarginate on lower half behind. In other respects quite similar to *Hyalomyia* Robineau-Desvoidy.

Genotype, the following species.

*Tetrapteromyia klossi* sp. n. (Fig. 1.)

*Male.*—Head black, densely white dusted on face, cheeks, and occiput, much less noticeably white dusted on anterior extremities of frontal orbits; antennae black; palps testaceous-yellow; genal hairs white, frontal hairs black. Thorax black, shining, with a complete fascia of dense golden brown dust in front of suture, and the pleura broadly greyish-yellow dusted at same point. Abdomen black, semitransparent yellow at base below, the dorsum densely yellowish-brown dusted except on bases of first visible tergite. Legs black. Wings greyish-hyaline, with a blackish mark on entire costa which extends over field to third vein, and is paler in costal cell. Lower calypter black, upper one and the hollow in lower one immediately below it yellowish-white. Halteres yellow.

Frons about 1.5 as wide as third antennal segment, ocellars and verticals short but evident; orbits narrow, linear above; face concave, space between vibrissae about

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\* For the second paper dealing with *Limnophora* R.-D., and its nearest relatives, see Journ. F.M.S., Mus., Vol. XIV, 1929, pp. 453-458.

1.5 as great as that between either eye, space between either and parafacial about equal to latter; third antennal segment rather broad, rounded at apex, about twice as long as second; arista longer than antennae, second segment not elongated; vibrissal angle not projecting, vibrissae short. Thorax with the posterior presutural and two posterior postsutural pairs of dorsocentrals of moderate length, prescutellar acrostichals long; sternopleurals 1 + 1; scutellars four, apical pair at tip. Abdomen as long as thorax and fully 1.5 as wide as it. Mid tibia with a ventral an anterodorsal, and two posterior bristles; hind femur with one preapical anteroventral bristle, hind tibia with two anteroventral, two anterodorsal, and two posterodorsal bristles. Third wing vein bare at base.

Length, 4.5 mm.

Type, Malaya Peninsula, Kedah, Catchment area near Jitra, 7.iv. 1928 (H. M. Pendlebury). Federated Malay States Museums. Type to be deposited in the British Museum, London.

### Tribe Actiini.

#### Genus *Actia* Robineau-Desvoidy.

This genus as generally accepted contains several well defined segregates possessing characters which are generally regarded as of generic importance in the family. Some of these segregates have been recognized by various authors and accorded generic or subgeneric rank, such as *Thryptocera* Macquart, *Schizotachina* Walker, and *Schizactiana* Curran, but Lundbeck and Stein in their works on the European forms have considered the genus in a broad sense and ranked certain groups within it as subgenera.

In my treatment of those Oriental species now available I have accepted the same standards as the authors last mentioned, and, apart from introducing an additional subgenus and a new diagnostic character in the large or small lower stigmatal bristle, I add little to group criteria within the genus (see under *Neoplectops* on a subsequent page of this paper). This segregate in which the lower stigmatal bristle is about as long and strong as the upper one and downwardly-directed might be considered as entitled to subgeneric rank but for the fact that it contains two groups of species, one, represented by one species apparently, in which the third antennal segment of the male is cleft and the wings have only the third vein setulose the other group having the third antennal segment of the male simple, so far as I am aware and the first and third veins partly setulose. The American and Australian species which have the third antennal segment cleft in the male have the lower stigmatal bristle small and fine, and only the third wing

vein setulose at base. The fissicorn species described below is placed in this genus in its broadest interpretation, belonging to that segregate in which this character is confined to the male sex. Van der Wulp erected the genus *Diglossocera* for a somewhat similar Javanese species, *bifida* van der Wulp; but his description, while providing characters for the differentiation of the two species, does not make mention of the nature of armature of the wing veins if any, and the exceptional height of the cheek as presented in his figure of *bifida* does not indicate a close affinity between the two forms. An examination of the van der Wulp type is essential to the determination of its generic status. The fissicorn genus *Acronarista* Townsend is closely related to *Plectops* Coquillett.

The genus *Bucentes* Latreille (*Siphona* Meigen) is very similar to *Actia*, differing only in having the proboscis very long slender, and geniculated, its entire length equal to, or exceeding, that of the insect. It is noteworthy however that there are some species about intermediate between the two extremes, and it requires arbitrary treatment to segregate some of these. One such group is *Pseudosiphona* Townsend. I am inclined to disregard genera based upon the structure of the proboscis when there are intermediate forms as here, but I am of the opinion that the proper place for the adoption of this course, if it be decided upon, would be in an extensive survey of the species involved from all over the world, and not in a fragmentary treatment such as the present paper.

In all the species the sixth wing vein is much longer than is usual in the family, being carried to, or almost to the margin of the wing, the hypopleural bristles are in *Actia* invariably three in number, the third vein ends almost in the wing tip, the first posterior cell is never petiolate, the auxiliary vein is almost invariably very noticeably bent near its apex, with its tip running along costal vein for a variable length before fusing with it, the prosternum is haired on the sides, the third antennal segment is very much longer than second, extending almost to mouth margin, and in both sexes there are two or more strong forwardly directed bristles on each orbit laterad of the inner series. Scutellum as in fig. 2.

In the following pages I deal with twenty-four species which occur in the Malayan region and present below a key for their separation based upon characters which I hope may be serviceable for distinguishing them from others which no doubt occur in the same region. It is not impossible that some at least of those species occur in the Palearctic region, and that amongst them there are some that have already been described, but I can determine none of them as such at this time. Many of the



species are very similar in general appearance and it is only by careful comparison that one is able to distinguish them. I have made no attempt to utilize as distinguishing characters the hypopygia of the males though I am convinced that in these organs there will be found good diagnostic features. I have figured the hypopygium of one species to show the general structure (fig. 3).

There are no indications on the labels of any of the species now before me what the larval habits are, but they are without any doubt parasitic, and from what is now known of the Palearctic species probably attack lepidopterous larvae.

In the following key I have attempted to make use of characters which are absolute, such as the absence or presence of particular bristles or hairs, rather than comparative characters, such as the relative lengths of bristles or sections of wing veins, in my major groupings, but it is not possible to place absolute dependence upon the hairing of the veins in all cases as is indicated in *brunnea* which has a very few widely separated hairs or setulae on the undersurface of first vein near apex, which to my mind suggests that sometimes these may be lacking. However without series of the species involved one can do no better than arbitrarily distinguish the material in hand by the best means available.

#### Key to the Species.

1. First wing vein bare on at least the apical half above and below - - - - 2.
- First wing vein setulose on at least the apical third of its upper side - - - - 7.
2. Lower stigmatal bristle long and strong, equal to, or exceeding, the propleural one, directed downward; third antennal segment of male cleft from near base to apex; setulae on third wing vein extending to middle of its apical section on upper side; ultimate section of fifth vein about three-fourths as long as penultimate section; first wing vein with a single setula near middle on upper surface\* - - - - *uniseta* sp. n.

\* Possibly the presence of a single bristle or setula on first vein above is abnormal as it does not occur in the female which I assign to this species.

- Lower stigmatal bristle undeveloped, represented by a short hair - - - - 3.
- 3. Setulae on upper side of third wing vein extending to well beyond inner cross-vein; parafacials not haired below level of lower frontal bristle; abdomen black, with narrow but distinct white dusted bases to the tergites; postsutural dorsocentrals in four pairs; interfrontalia at anterior extremity a little wider than either orbit at same point (female) - - - *deferens* sp. n.
- Setulae on upper side of third wing vein not extending to inner cross-vein - - - 4.
- 4. Postsutural dorsocentral bristles in four pairs - - 5.
- Postsutural dorsocentral bristles in three pairs; abdomen more or less yellow; inner cross-vein distinctly proximad of middle of discal cell; ultimate section of fifth vein very noticeably shorter than penultimate section of fourth 6.
- 5. Ultimate section of fifth vein fully twice as long as penultimate section of fourth, and about as long as penultimate section of fifth; abdomen more or less conspicuously yellow on sides basally; fourth vein obsolete beyond preapical bend; interfrontalia at anterior extremity about half as wide as either orbit at same point; mid tibia without an anterodorsal bristle near middle - - - *eucosmae* Bezzi.
- Ultimate section of fifth vein subequal in length to penultimate section of fourth and about half as long as penultimate section of fifth; abdomen entirely black, bases of tergites white dusted; fourth

- vein complete; interfrontalia at anterior extremity fully twice as wide as either orbit at same point; mid tibia with a strong anterodorsal bristle beyond middle - - - *laticornis* sp. n.
6. Ocellar bristles short and hair-like; frons of male not over one-fifth, of female not over one-fourth, of the head width - - - *angustifrons* sp. n.
- Ocellar bristles at least as long as upper reclinate orbital; frons of male over one-fourth, of female almost one-third, of head width - *selangor* sp. n.
7. Setulae on upper side of first wing vein confined to a little more than the apical third (i.e., to that section beyond the slightly thickened portion beyond middle), never extending to a point above furcation of second and third veins - - - 8.
- Setulae on upper side of first wing vein always present from a point proximad of furcation of second and third veins to, or almost to, apex - 22.
8. Setulae on apical portion of first wing vein confined to the upper side - - - 9.
- Setulae on apical section of first wing vein present both above and below - - - 16.
9. Parafacials with complete series of stiff hairs which are longest near lowest level of eyes (fig. 17); arista thick, about as long as third antennal segment, first segment not longer than thick, second about half as long as third, the latter tapered abruptly on apical third; ultimate section of fifth wing vein not noticeably longer than penultimate section of fourth (Subgenus *Pseudactia* subgen. nov.) - *hirticeps* sp. n.

- Parafacials not setulose or haired below middle; arista not so much thickened, the second segment not nearly half as long as third - - 10.
- 10. Postsutural dorsocentral bristles in three pairs; lower stigmatal bristle minute or lacking; setulae on third wing vein not extending beyond inner cross-vein; fifth vein not attaining margin of wing - 11.
- Postsutural dorsocentral bristles in four pairs - - 12.
- 11. Inner cross-vein of wing at middle of discal cell; outer cross-vein distinctly nearer to inner cross-vein than to bend of fourth vein; abdomen entirely black, with white dusted bases to tergites; third antennal segment almost as broad as eye length - - *magnicornis* sp. n.
- Inner cross-vein about one-third from base of discal cell; outer cross-vein almost midway from inner cross-vein to bend of fourth vein; abdomen conspicuously yellow at bases of tergites, especially on sides, and at base of venter, the dust on bases of tergites yellowish - - - - *philippineusis* sp. n.
- 12. Lower stigmatal bristle undeveloped, represented by a weak hair or lacking - - 13.
- Lower stigmatal bristle about as large as upper one, curved downward - - - 15.
- 13. Sixth wing vein attaining margin of wing; third vein with two strong black setulae at base above; either frontal orbit at anterior proclinate outer bristle twice as wide as the interfrontalia; face silvery white dusted - - *aberrans* sp. n.
- Sixth wing vein ceasing at some distance from wing margin; third wing vein with

- setulae on upper side from base to distinctly beyond inner cross-vein; neither frontal orbit at widest point wider than interfrontalia; face not silvery white dusted 14.
14. Face golden yellow dusted; proboscis much more slender than usual in this genus, the apical labellae about as long and slender as the apical chitinous portion; the first vein bare at apex below - *siphonosoma* sp. n.
- Face yellowish white dusted; proboscis not markedly more slender than usual, the apical labellae stout, and not as long as the apical chitinous portion; the first vein with a few hairs at apex below - *brunnea* sp. n.
15. Outer cross-vein of wing much farther from margin of wing than usual, the ultimate section of fifth vein longer than its penultimate section, and fully three times as long as penultimate section of fourth vein - - - *suspecta* Malloch.
- Outer cross-vein of wing about normal in position, the ultimate section of fifth vein about two-thirds as long as its penultimate section, and not over twice as long as penultimate section of fourth *similata* sp. n.
16. Lower stigmatal bristle long and strong, directed downward; sixth wing vein extending to margin of wing; no short fine hair on upper anterior angle of hypopleura *hyalinata* sp. n.
- Lower stigmatal bristle either lacking or represented by a short fine hair - - - 17.
17. Sixth wing vein attaining margin of wing; no short fine hair on upper anterior angle of hypopleura - - *completa* sp. n.
- Sixth wing vein not attaining margin of wing - - - 18.

18. Veins 1, 3 and 5, of the wing partly setulose above - - - 19.
- Veins 1 and 3, of the wing partly setulose above, fifth vein bare - - - - 20.
19. Wing with a conspicuous black spot extending from apex of second vein to tip, and filling same extent of apex of first posterior cell, but not extending over the curve of fourth vein at apex (male) - - - - *punctipennis* sp. n.
- Wing without an evident dark apical spot (female) - *punctipennis* sp. n.
20. Wing with a quite conspicuous apical black or dark brown spot or mark - - 21.
- Wing without dark apical spot or mark (cf. *brunnea*) - *maculipennis* sp. n.
21. Apical spot on wing very dark brown, conspicuous, and sharply limited; inner cross-vein about three-sevenths from base of discal cell, outer cross-vein nearer to bend of fourth vein than to inner cross-vein; third antennal segment at its widest point about as broad as eye at its widest point - - - *apicipunctata* Malloch.
- Apical spot on wing paler brown, not so conspicuous, and not sharply limited - *maculipennis* sp. n.
22. First and third wing veins setulose above - - - 23.
- First, third and fifth, wing veins setulose above; sixth wing vein incomplete - - 26.
23. Lower stigmatal bristle long, downwardly - directed; abdomen and legs black - - 24.
- Lower stigmatal bristle undeveloped; abdomen and legs largely yellow - - - *pendleburyi* sp. n.
24. Sixth wing vein not attaining margin of wing; ultimate section of fifth vein as long as penultimate section - - *subaequalis* sp. n.

- Sixth wing vein attaining margin of wing - - - 25.
- 25. Ultimate section of fifth wing vein as long as penultimate section; bend of fourth vein as in fig. 16a. - - - *monticola* sp. n.
- Ultimate section of fifth wing vein distinctly shorter than penultimate section; bend of fourth vein as in fig. 16b - *rotundipennis* sp. n.
- 26. Legs and abdomen black; postsutural dorsocentrals in four pairs; fourth wing vein as distinct beyond as before bend (Oriental) - - - *mimetica* sp. n.
- Legs and abdomen largely yellow - - - 27.
- 27. Fourth wing vein very faint beyond the preapical bend; dorsocentral bristles 3 pairs behind suture; apical section of fifth wing vein as long as preapical section (Australia) \**darwini* Malloch.
- Fourth wing vein as distinct beyond as before preapical bend; apical section of fifth vein not half as long as preapical section; postsutural dorsocentrals in four pairs - 28.
- 28. Parafacials haired on upper half; apical section of fifth vein about half as long as preapical section, and as long as preapical section of fourth vein; inner cross-vein at, or slightly beyond, middle of discal cell - - - *rotundicornis* sp. n.
- Parafacials not haired below level of lower frontal bristle; apical section of fifth vein not over one-third as long as preapical section, and less than two-thirds as long as preapical section of fourth vein; inner cross-vein almost two-fifths from base of discal cell - - - 29.
- 29. Palpi quite conspicuously widened - - - *latipalpis* sp. n.
- Palpi but slightly widened - *dubia* sp. n.

\* This species is being described in an Australian paper by the author.

*Actia uniseta* sp. n. (fig. 2, 4a).

*Male*.—Head testaceous, face almost white, densely dusted, interfrontalia rufous, orbits and triangle densely grey dusted, more brownish posteriorly, occiput fuscous, densely grey dusted; antennae orange, third segment except base dark brown; arista brown; palpi orange. Thorax black, slightly shining, densely yellowish grey dusted, dorsum without evident vittae. Abdomen glossy black each tergite except the first visible one with a conspicuous, rather narrow, basal fascia of white dust. Legs black, fore femora brownish, trochanters and tibiae dusky yellow. Wings greyish hyaline. Calyptrae whitish-yellow. Halteres yellow.

Frons at vertex almost one-third of the head width, gradually widened to anterior margin, each orbit at middle fully half as wide as the interfrontalia; outer verticals half as long as inner pair, postverticals shorter than the forwardly directed and divergent ocellars, upper two or three orbitals directed backward, anterior three or four directed inward, and very unequal, forwardly directed outer orbitals two in number, a few fine hairs on anterior lateral portion of orbits descending distinctly below apex of second antennal segment; profile as in fig. 4, third antennal segment densely pilose; arista microscopically pubescent, second segment about five times as long as thick; palpi slightly widened, almost bare. Thorax normal; scutellum with four pairs of marginal bristles of unequal lengths, the apical pair very short and fine, and a pair of short preapical bristles; sternopleurals 3, triangularly arranged, no hairs on sternopleura; lower stigmatal long, curved downward. Abdomen without discals. Legs normal, hind tibia with 6-8 anterodorsal bristles, one longer than the others, about ten shorter posterodorsal bristles, and about five fine anteroventral bristles. First wing vein with one bristle above near middle, otherwise bare, third vein with one bristle at base below, bristled above to middle of its apical section, fourth vein complete, sixth distinct to margin, fifth with ultimate section over three-fourths as long as penultimate section.

*Female*.—Differs from the male in having the antennae darker, with third segment simple, and no bristle on upper side of first wing vein.

Length, 4 mm.

Type, male, Bukit Kutu, Selangor, Malay Peninsula, April 18, 1926, 3,500 feet (H. M. Pendlebury); allotype, Kedah Peak, Malay Peninsula, 3,000 feet, March 18, 1928 (H. M. Pendlebury). Federated Malay States Museums. Type to be deposited in the British Museum, London.

It would appear worth noting that in *Schizotachina* Walker there is a transverse series of bristles on the disc



of the fourth visible abdominal tergite which is not the case in the above species nor any of those included in *Actia* in the present paper.

***Actia deferens* sp. n.**

*Female*.—Similar to *uniseta* female in colour, the scutellum yellowish at apex. Third antennal segment broader and shorter than in *uniseta*; interfrontalia at anterior extremity about 1.5 as wide as either orbit at same point; hairs not descending below lower frontal bristle; second segment of arista about twice as long as thick; proboscis stout; palpi club-shaped. Thorax with four pairs of postsutural dorsocentrals, the lower stigmatal bristle undeveloped, sternopleurals 3. Abdomen as in *uniseta*. Mid tibia with a strong anterodorsal bristle beyond middle. First wing vein bare, third setulose to distinctly beyond inner cross-vein on the upper side, inner cross-vein about three-sevenths from base of discal cell, ultimate section of fifth vein subequal to penultimate section of fourth and about half as long as its own penultimate section, outer cross-vein a little nearer to inner cross-vein than to bend of fourth, sixth vein obsolete at apex.

Length, 3 mm.

Type, Malay Peninsula, Kedah Peak, 3,000 feet, March 16, 1928 (H. M. Pendlebury). Federated Malay States Museums. Type to be deposited in British Museum, London.

***Actia suspecta* Malloch.**

A small black species closely resembling *monticola* described herein (p. ), but differing from it in having the first wing vein haired only on the apical third above, and in some other characters.

I have seen only the type specimen, from Pusa, Bengal. The type will be deposited in the British Museum, London.

***Actia eucosmae* Bezzi.**

This species is readily distinguished from any other included in this paper by the lack of that portion of the fourth wing vein beyond the preapical bend, and also by the absence of a strong submedian bristle on the anterodorsal surface of the mid tibia. The interfrontalia at its anterior extremity is only about half as wide as either orbit at same point, the lower stigmatal bristle is undeveloped, the postsutural dorsocentrals are in four pairs, and the first wing vein is bare. The abdomen is largely yellow basally, especially on the sides.

Originally described from Australia, from whence I have seen it. It also occurs in the Philippine Islands, specimens from Los Banos, 'ex. nut grass cage,' Coll. 2, 1926 (Pemberton), being correctly identified in the United States National Museum collection by Dr. J. M. Aldrich.

No other species of *Actia* known to me has the anterodorsal bristle on mid tibia lacking, and some have more than one such bristle.

*Actia laticornis* sp. n. (fig. 5).

*Female*.—Black slightly shining. Interfrontalia and centre of cheeks reddish-brown, face clay coloured below, ocellar triangle, occiput, frontal orbits, face, and cheeks, densely grey dusted; antennae black, slightly reddish at base of inner side of third segment; palpi testaceous yellow. Thorax evenly grey dusted, slightly brownish on each side behind suture on mesonotum, and on disc of scutellum, the latter pale at apex. Abdomen almost glossy, with rather broad basal fasciae of white dust on visible tergites 2 to 4. Legs black, tibiae brownish-yellow. Wings hyaline. Upper calypter white, lower one brown. Halteres yellow.

Frons at vertex over one-third of the head width, widest part of each orbit about half as wide as interfrontalia at same point; head in profile as fig. 5; hairs continued on parafacials to below base of third antennal segment; proboscis stout. Thorax with four pairs of postsutural dorsocentrals; lower stigmatal undeveloped. Visible abdominal tergites three and four each with six apical bristles. Mid tibia with a submedian anterodorsal bristle. Third wing vein setulose from base to about midway to inner cross-vein above and with one setula at base below; the other veins bare; inner cross-vein close to middle of discal cell; outer cross-vein a little nearer to inner cross-vein than to bend of fourth; ultimate section of fifth vein about half as long as penultimate and slightly longer than penultimate section of fourth vein; sixth vein complete.

Length, 3 mm.

Type, Malay Peninsula, Selangor, Bukit Kutu, 3,500 ft. April 19, 1926 (H. M. Pendlebury) Federated Malay States Museum. Type to be deposited in the British Museum, London.

This species has the third antennal segment wider and shorter than usual.

*Actia angustifrons* sp. n. (fig. 6).

*Male*.—Head testaceous, upper occiput fuscous on each side, ocellar triangle and frontal orbits brownish yellow dusted, face and cheeks white dusted, occiput grey dusted, more yellowish on postocular orbits; antennae testaceous-yellow, third segment brownish except basally; aristae testaceous yellow, dark apically; palpi and proboscis testaceous-yellow. Thorax blackish-brown, slightly shining, pleura paler below, mesonotum with traces of four dark vittae. Abdomen brownish-testaceous, with a dark

dorsocentral vitta, and dark apices to tergites three and four, the latter two abnormal through injury in pupal stage apparently. Legs testaceous-yellow, tarsi slightly darkened. Wings brownish-hyaline, darker costally. Calyptrae yellowish-brown. Halteres yellow.

Frons at vertex about one-seventh of the head width, slightly widened anteriorly, the orbits nowhere as wide as the interfrontalia; ocellars short and hair-like, outer verticals not half as long as the inner pair; profile as fig. 6; third antennal segment about four times as long as wide; aristae pubescent, second segment about twice as long as thick; palpi club-shaped. Thorax with three pairs of postsutural dorsocentrals; lower stigmalat not developed, all three sternopleurals strong, and no hair on the upper anterior angle of hypopleura. Abdomen narrowly ovate, apical bristles on third and fourth visible tergites long. Legs more slender than usual, mid tibia with an anterodorsal submedian bristle. First wing vein bare, third setulose from base to about midway to inner cross-vein above, and with one setula at base below; inner cross-vein at a little over one-third from base of discal cell; outer cross-vein a little nearer to bend of fourth vein than to inner cross-vein; ultimate section of fifth vein about one-fourth as long as penultimate section and not half as long as penultimate section of fourth vein; sixth vein complete.

*Female*.—Darker in colour than the male, especially on the abdomen which has the bases of the tergites with yellowish dust; the legs are also darker, yellowish-brown, but the wings are not as dark as in the male.

Frons at vertex about one-fourth of the head width, ocellars short and fine, the other frontal bristles longer and stronger than in the male. Abdomen broadly ovate, third and fourth visible tergites each with six apical bristles. Otherwise as male.

Length, 4.5 mm.

Type, male, Malay Peninsula, Kedah Peak, 3,300 feet, March 11, 1928; allotype, same locality, 3,000 feet, March 18, 1928 (H. M. Pendlebury). Federated Malay States Museums. To be deposited in British Museum, London.

An aberrant species, but acceptable as belonging to *Actia* in its widest sense. The very narrow frons of the male, and the short fine ocellar bristles in both sexes, distinguish the species from any of its allies now before me, and from any hitherto described.

*Actia selangor* sp. n. (fig. 7).

*Male and Female*.—Head testaceous-yellow, upper occiput fuscous on each side, vertex, ocellar triangle, and upper frontal orbits, yellow dusted, orbits becoming whitish dusted in front; face and cheeks white dusted; antennae reddish testaceous, third segment more or less intensely browned

except at base; palpi and proboscis testaceous yellow. Thorax testaceous to brownish in colour, and rather densely grey dusted especially on mesonotum, which is without evident vittae, humeri and scutellum more or less extensively testaceous-yellow. Abdomen testaceous yellow, glossy, with an interrupted dark dorsocentral vitta except on first tergite, and dark apices to tergites three and four, bases of tergites not noticeably white dusted. Legs testaceous-yellow, apices of mid and hind femora usually more or less distinctly but narrowly blackened. Wings greyish hyaline, slightly darkened along costa in the type male. Calyptrae whitish, disc of lower one slightly browned. Halteres yellow.

Head of female in profile as figure 7; frons at vertex a little less than one-third of the head width; ocellars quite strong, as long as the preverticals (i.e., the upper reclinate orbitals); hairs descending to opposite base of third antennal segment on parafacials; arista pubescent, second segment about three times as long as thick. Thorax as in *angustifrons*. Tergites three and four each with six apical bristles. Wings as in *angustifrons*, but the setulae on base of third vein extend to, or almost to, the inner cross-vein.

Length, 3-4 mm.

Type, male, Malay Peninsula, Selangor, Bukit Kutu, April 20, 1926; allotype, Kedah Peak, 3,300 feet, March 16, 1928; four paratypes from last locality, March 13, 16, and 16, 1928, (H. M. Pendlebury). One headless specimen from Selangor, April 18, 1926, by same collector, appears to belong to this species. Federated Malay States Museums. Type to be deposited in British Museum, London.

*Actia magnicornis* sp. n. (fig. 8).

*Male*.—Similar to *laticornis* in size and colour. Head fuscous, face testaceous, interfrontalia reddish-brown, frontal orbits, triangle, and vertex, dark brown dusted, face and cheeks greyish-white dusted; antennae black, basal two segments and the extreme base of third segment brownish; palpi reddish testaceous. Thorax black, pleura and lateral margins of mesonotum greyish dusted, remainder of the latter and scutellum brownish dusted. Abdomen glossy black, with white dusted bases to tergites which are broken in centre. Legs pitchy, the tibiae brownish-yellow. Wings hyaline. Calyptrae greyish, disc of lower one darker. Halteres yellow.

Frons fully one-third of head width at vertex, either orbit at middle equal in width to interfrontalia; ocellars well developed; fine hairs lacking below lower frontal bristle; head in profile as figure 8; third antennal segment very wide; second arisal segment about four times as long as thick. Thorax with three pairs of postsutural dorsocentral bristles, the lower stigmal bristle undeveloped, sternopleurals 3. Abdomen ovate, tergites three and four each with six apical

bristles. Mid tibia with a submedian anterodorsal bristle. First wing vein setulose on apical third above, third vein setulose to about inner cross-vein above; inner cross-vein close to middle of discal cell; ultimate section of fifth vein about four-fifths as long as penultimate section of fourth and one-third as long as its own penultimate section; outer cross-vein distinctly nearer to inner cross-vein than to the bend of fourth vein; sixth vein incomplete.

Length, 3 mm.

Type, Malay Peninsula, Selangor, Bukit Kutu, 3,500 feet, April 15, 1926 (H. M. Pendlebury). Federated Malay States Museums. To be deposited in British Museum, London.

The very broad third antennal segment of this species should serve to distinguish it from any of its allies, though *laticornis* is very similar.

*Actia philippinensis* sp. n.

*Female*.—Head testaceous yellow, upper occiput fuscous on each side, interfrontalia reddish-brown, triangle and frontal orbits brownish grey dusted, face and cheeks whitish grey dusted; antennae brownish-yellow, third segment fuscous except at base; palpi testaceous yellow. Thorax fuscous, humeri and apex of scutellum testaceous, disc of mesonotum brownish dusted, lateral margins and pleura more greyish dusted. Abdomen testaceous yellow, tergites broadly black centrally, tapering off at sides leaving the anterior margins progressively wider yellow to lateral curve, the anterior margins with yellowish dust which is interrupted in centre and widest on each side of the break. Legs tawny yellow. Wings brownish hyaline. Calyptrae whitish, disc of lower one browned. Halteres yellow.

Frons at vertex over one-third of the head width, either orbit about half as wide as interfrontalia; third antennal segment not wider than usual; arista pubescent, second segment about twice as long as thick; proboscis rather slender, apical labellae not as long as in *siphonosoma*. Thorax with three pairs of postsutural dorsocentrals; lower stigmatal bristle undeveloped; sternopleurals 3; no fine hair on the anterior upper angle of hypopleura. Tergites three and four of abdomen each with six apical bristles. Mid tibia with a strong submedian anterodorsal bristle. First wing vein setulose on apical third or more above, third vein setulose to inner cross-vein, the latter situated at about one-third from base of discal cell; outer cross-vein about midway between inner cross-vein and bend of fourth vein; sixth vein incomplete.

Length, 4.5 mm.

Type, Baguio, Benguet, Philippine Islands (C. F. Baker). Type in author's collection.

*Actia aberrans* sp. n. (fig. 9).

*Male?*—Face and cheeks testaceous, the former densely silvery white dusted, the cheeks yellowish dusted; interfrontalia brown; frontal orbits testaceous in front, fuscous behind, densely white dusted on anterior outer portion, yellow dusted along the inner margins and on posterior third; ocellar triangle fuscous, yellow dusted; occiput fuscous, grey dusted, postocular orbits densely silvery white dusted; antennae orange-yellow, third segment brown on upper margin and apex; palpi and aristae orange-yellow; proboscis fuscous. Thorax shining black, rather densely white dusted, mesonotum with four black vittae in front of suture; apex of scutellum whitish-yellow. Abdomen glossy black, second visible tergite with very narrow central and lateral marks of white dust on anterior margin, third and fourth tergites each with a narrow complete fascia of dense white dust on bases. Legs black, trochanters yellowish. Wings hyaline, yellowish at bases, veins pale. Calyptrae yellowish-white. Halteres yellow.

Frons at vertex a little less than one-third of the head width, much widened to anterior margin, interfrontalia not half as wide as either orbit at anterior extremity; ocellars quite strong; orbitals normal; no hairs below lower frontal; head in profile as figure 9; arista subnude, thickened on basal four-fifths, second segment about twice as long as thick; palpi slightly club-shaped; proboscis stout. Thorax with four pairs of postsutural dorsocentrals, lower stigmatal bristle undeveloped, sternopleurals 3; apical scutellars very small. The usual central apical pair of bristles on second visible tergite very poorly developed, tergites three and four each with six apical bristles. Legs stout; mid tibia with a strong submedian anterodorsal bristle. First wing vein setulose from a little beyond middle to near apex on upper side, third vein with two strong setulae at base above, and two weaker setulae at base below, inner cross-vein close to middle of discal cell; outer cross-vein a little nearer to the bend of fourth vein than to inner cross-vein (5:7), ultimate section of fifth vein fully half as long as penultimate section of fourth and a little less than one-third as long as its own penultimate section; sixth vein complete; fourth vein more angularly bent than usual and rather indistinct from bend to apex.

Length, 5 mm.

Type, Malay Peninsula, Selangor, Kuala Lumpur, April 11, 1926 (H. M. Pendlebury), Federated Malay States Museum. Type to be deposited in British Museum, London.

An aberrant species in the matter of the wide frontal orbits, rather evident facial ridges in profile, and the position of the outer cross vein. Sex doubtful.

*Actia brunnea* sp. n.

*Female*.—Face and cheeks testaceous yellow, with whitish dust, frons dark brown, frontal orbits densely brownish grey dusted, occiput fuscous, densely grey dusted, central upper part brown; antennae reddish-yellow, third segment fuscous on upper margin from near base, becoming entirely fuscous from middle to apex; aristae dark brown; palpi orange-yellow. Thorax shining black, with yellowish-brown dust, which is not very dense, on dorsum. Abdomen shining brownish-black, brownish-yellow and semipellucid basally on sides and on basal half of venter; bases of tergites narrowly white dusted. Legs pitchy-black, fore coxae and trochanters brownish-yellow. Wings brownish hyaline. Calyptrae grown, upper one paler. Halteres brownish-yellow.

Frons at vertex nearly one-third of the head width, postverticals small but distinct, interfrontalia at anterior extremity about 1.5 as wide as either orbit, hairs not descending below apex of second antennal segment on parafacial; third antennal segment of moderate width, rounded at apex; second segment of arista about twice as long as thick; palpi quite noticeably widened at apices. Thorax with four pairs of postsutural dorsocentrals, lower stigmatal bristle not developed, sternopleurals 3, no hair on upper anterior angle of hypopleura. Abdomen broadly ovate, third and fourth visible tergites each with six apical bristles. First wing vein setulose on apical third above, and with one to three widely spaced setulae before apex below (possibly abnormal; the vein may be bare normally), third vein with the setulae continued to about level of outer cross-vein on upper side, fifth vein bare, its ultimate section about two-thirds as long as penultimate section of fourth, and not over one-third as long as its own penultimate section, inner cross-vein close to middle of discal cell, outer cross-vein about midway between bend of fourth vein and inner cross-vein.

Length, 5.25 mm.

Type, Malay Peninsula, Kedah Peak, 3,000-3,500 feet, March, 15, 1928 (H. M. Pendlebury). Federated Malay States Museums. To be deposited in British Museum, London.

If one considers the first vein as setulose below apically this species will run down to *maculipennis* female, in the foregoing key to species, but that species has the thorax almost entirely dull on dorsum owing to the presence of dense grey dusting, the femora and tibiae usually dusky yellow, and the dorsum of abdomen more extensively grey dusted.

*Actia siphonosoma* sp. n. (fig. 10).

*Male*.—Head orange-yellow, face, cheeks, and lower occiput, golden yellow dusted; interfrontalia brownish-red,

frontal orbits golden yellow dusted in front, yellow dusted on remainder of their extent, triangle yellow dusted, upper occiput fuscous, densely grey dusted; antennae orange-yellow, third segment slightly darker at apex above; aristae brownish, darker at apices; palpi and proboscis orange-yellow. Thorax black, slightly shining, densely grey dusted, dorsum slightly vittate, humeri and apex of the scutellum yellowish. Abdomen semitransparent yellow, with a black dorsocentral vitta, a narrow black apex to second visible tergite and broad black apices to tergites three and four, tergites two to four with narrow white dusted bases. Legs yellow, apices of femora, and the tibiae to a variable degree, infuscated, tarsi fuscous. Wings greyish hyaline. Calyptrae yellowish white, lower one largely browned on disc. Halteres yellow.

Head in profile as figure 10; frons at vertex a little less than one-third of the head width, postverticals small, bristling normal; proboscis more elongate and slender than usual; parafacials bare; arista microscopically pubescent. Thorax with four pairs of postsutural dorsocentrals, lower stigmatal bristle undeveloped, sternopleurals 3, no hair on upper anterior angle of hypopleura. Tergites three and four each with six apical bristles. Anterodorsal bristle on mid tibia long. First wing vein setulose on apical third above, third vein setulose to distinctly beyond inner cross-vein above, and with one or two setulae at base below; inner cross-vein at about two-fifths from base of discal cell; outer cross-vein about midway from inner cross-vein to bend of fourth vein; ultimate section of fifth vein about two-thirds as long as penultimate section of fourth vein and hardly over one-third as long as its own penultimate section; sixth vein not attaining margin of wing.

Length, 4.75 mm.

Type, Malay Peninsula. Selangor, Bukit Kutu, 3,500 feet, April 16, 1926 (H. M. Pendlebury). Federated Malay States Museums. To be deposited in British Museum, London.

This species is about intermediate between *Actia* and *Bucentes* in structure of the proboscis, but has the sixth wing vein incomplete.

*Actia similata* sp. n.

*Male*.—Very similar to *laticornis*. It differs from it in having the frontal orbits brown, and not grey, dusted; the mesonotum entirely brown dusted instead of grey.

Structurally it differs from *laticornis* in having the frons at vertex less than one-third of the head width, the orbits over half as wide as interfrontalia at their anterior extremities, and the fine hairs descending to a little below the base of the third antennal segment on parafacials. Third antennal segment similar to that of *laticornis*; arista pubescent, second segment about three times as long as



thick; lower stigmatal bristle long and strong, downwardly directed; sternopleurals 3; abdominal tergites three and four each with six apical bristles. Wings differing from those of *laticornis* in having the setulae on base of third vein continued to level of outer cross-vein; ultimate section of fifth vein fully half as long as penultimate section; sixth vein complete.

Length, 3.25 mm.

Type, Malay Peninsula, Selangor, Bukit Kutu, April 20, 1926 (H. M. Pendlebury). Federated Malay States Museums. To be deposited in British Museum, London.

The darker colour of the frontal and thoracic dusting and the long strong downwardly directed lower stigmatal bristle readily distinguish this species from *laticornis*.

There are two females before me which differ in having the third antennal segment narrower and the basal two segments reddish yellow. I consider they are the same species. They are labelled simply Fraser's Hill, No. 168, and were sent to me by Mr. B. A. R. Gater some years ago from the Federated Malay States. There is nothing on the labels that would indicate whether the specimens were reared or not.

*Actia hyalinata* sp. n.

*Male and Female*.—Head testaceous yellow, frontal orbits and triangle grey to yellowish dusted, face and cheeks white dusted, upper occiput fuscous on each side; antennae orange-yellow, third segment largely browned apically; palpi testaceous yellow; arista orange-yellow at bases, darker at apices. Thorax fuscous, humeri and apex of scutellum more or less yellow, entire surface with dense grey dust. Abdomen usually entirely black in the female, largely yellow on sides basally in male, and with narrow white dusted bases to tergites, the male with a black central mark on second visible tergite, and nearly all of dorsal exposure of tergites three and four, black. Legs black, trochanters and tibiae yellowish, the male sometimes with a greater proportion yellowish. Wings hyaline. Calyptrae yellowish-white, disc of lower one slightly browned. Halteres yellow.

Frons at vertex not one-third of the head width; orbits about half as wide as interfrontalia; hairs descending slightly below lower frontal bristle, third antennal segment not very wide, about 2.5 as long as second; arista pubescent, second segment about 2.5 as long as thick; proboscis normal. Thorax with four pairs of postsutural dorsocentrals, lower stigmatal strong and downwardly directed, sternopleurals 3, no hair on upper anterior angle of the hypopleura. Abdomen with six apical bristles on tergites three and four. Mid tibia with a strong submedian anterodorsal bristle. First wing vein setulose on about the apical third above and

below; third setulose to, or almost to, level of outer cross-vein; inner cross-vein slightly beyond middle of discal cell; ultimate section of fifth vein about two-thirds as long as penultimate section and over 1.5 as long as penultimate section of fourth vein; outer cross-vein over 1.5 as far from bend of fourth vein as from inner cross-vein; sixth vein complete.

Length, 3.25-4 mm.

Type, male, and one male paratype, Malay Peninsula, Selangor, Bukit Kutu, April 18 and 19, 1926; allotype, Selangor, Kuala Lumpur, April 2, 1926; paratypes, 10 specimens, Kedah Peak, 2,000 to 3,500 feet, various dates in March, 1928 (H. M. Pendlebury); one female, Savaii, Samoa Islands, May 12, 1924 (E. H. Bryan Jr.).

The type and all material from the Malay Peninsula belongs to the Federated Malay States Museums, but the type will later be deposited in the British Museum; the paratype from the Samoan Islands was sent to me as part of the material from these islands which I have been working over for the London School of Tropical Medicine, and it will be returned by Dr. Buxton to the collector for deposition in the Bishop Museum in Hawaii.

A most remarkable point about this species is its occurrence in Samoa, the example from these islands agreeing perfectly with the others from the Federated Malay States. The species described from the Fiji Islands by Bezzi, *stigli-nae* Bezzi, is quite distinct from this one, being much closer to *deferens* Malloch, but it differs from the latter in having the ultimate section of fifth wing vein only a little shorter than its penultimate section, and the arista distinctly pubescent.

*Actia completa* sp. n. (fig. 11).

*Male*.—General colouration similar to that of *hyalinata*. Frontal orbits brownish grey dusted; abdomen yellow on sides of basal half.

The frons at vertex is a little less than one-third of the head width, the interfrontalia at middle is about as wide as either orbit as same point, the arista is pubescent and has the second segment about twice as long as thick, and the proboscis is similar to that of *siphonosoma* (fig. 11), except that it is fuscous, with the base yellow. Postsutural dorso-centrals four pairs, lower stigmatal bristle undeveloped, no fine hair on the upper anterior angle of hypopleura. Third visible abdominal tergite with six, fourth with four, apical bristles. Mid tibia with a moderately strong submedian anterodorsal bristle. First wing vein setulose on about the apical third above and below, third setulose to a little beyond the inner cross vein above and with one or two setulae at base below; inner cross-vein close to middle of discal cell; ultimate section of fifth vein a little shorter than penulti-

mate section of fourth and about two-fifths as long as its own penultimate section; outer cross-vein quite noticeably nearer to inner cross-vein than to the bend of fourth vein; sixth vein complete.

Length, 3.5 mm.

Type, Malay Peninsula, Selangor, Bukit Kutu, 3,500 feet, April 12, 1926 (H. M. Pendlebury). Federated Malay States Museums. Type to be deposited later in British Museum, London.

The elongated proboscis, complete sixth wing vein, and undeveloped lower stigmal bristle in combination distinguish this species from the others dealt with.

*Actia punctipennis* sp. n. (fig. 12, 13).

*Male*.—Head testaceous, interfrontalia reddish-brown, frontal orbits and triangle yellowish grey dusted, face and cheeks white dusted, upper occiput fuscous on each side; proboscis, antennae, palpi, and bases of aristae, reddish-yellow, apices of the aristae fuscous. Thorax fuscous, humeri and apex of scutellum testaceous yellow, the entire surface grey dusted. Abdomen testaceous yellow, shining, with a dark dorsocentral vitta on basal half, the apex of second visible tergite narrowly black, and apices of tergites three and four broadly black, the dorsum when seen from behind with the white dust extending over almost all of tergites, but with faint dark, or undusted, dots at bases of the hairs. Legs testaceous yellow, apices of hind femora slightly darkened. Wings hyaline, with a very conspicuous blackish-brown spot on costa extending from apex of second vein to apex of fourth, and not continued over bend of the latter (fig. 12). Calyptrae whitish, slightly darker on disc of lower one. Halteres yellow.

Frons at vertex about one-third of the head width, each orbit at its widest point about half as wide as interfrontalia; ocellar bristles well developed; hairs descending a little below lowest frontal bristle; third antennal segment about six times as long as second, and quite broad; arista pubescent, second segment fully twice as long as thick; profile as in figure 13; proboscis short, normal. Thorax with four pairs of postsutural dorsocentrals, the lower stigmal undeveloped, three sternopleurals, and a fine hair on upper anterior angle of the hypopleura. Visible tergites three and four of abdomen each with six apical bristles. Mid tibia with a strong submedian anterodorsal bristle. First wing vein setulose on about the apical third above and below, third vein setulose to well beyond level of outer cross-vein above and with a setula below at base, fifth vein setulose to about middle of discal cell above, bare below; inner cross-vein close to middle of discal cell; outer cross-vein slightly nearer to bend of fourth vein than to inner cross-vein; ultimate section of

fifth vein over half as long as penultimate section of fourth and over one-fourth as long as penultimate section of fifth; sixth vein incomplete.

*Female*.—Similar to the male in colour, but the third antennal segment is dark brown or fuscous, the aristaе are dark brown, and the apical dark spot of wing is lacking.

Structurally similar to the male, but the third antennal segment is narrower, and the inner cross-vein of wing is slightly proximad of middle of the discal cell.

Length, 4.5-5.25 mm.

Type, male, Malay Peninsula, Kedah Peak, 3,300-3,950 feet, March 14, 1928; allotype, and one paratype female, same locality, 3,000 feet, March 18, 1928, and 3,000-3,500 feet, March 15, 1928 (H. M. Pendlebury). Federated Malay States Museums. Type to be deposited in British Museum, London.

A similar sexual colour dimorphism of the wings occurs in a number of other genera, notably in *Pygophora* Schiner, in the *Muscidae*, in this region.

*Actia apicipunctata* Malloch. (figs. 3, 14).

This species is known to me only from the type specimen, a male, from the Philippine Islands. I have dissected the hypopygium which is figured herein (fig. 3). It is possible that the female has no dark apical spot on the wing. The lack of setulae on the fifth wing vein readily distinguishes this species from *punctipennis*, and the very sharply limited apical spot on the wing (fig. 14) distinguishes it from *maculipennis*.

Locality, Baguio, Benquet, Philippine Islands (C. F. Baker).

*Actia maculipennis* sp. n. (fig. 15).

*Male and Female*.—Practically the same in colour as *punctipennis* except in the marking of the wing of the male which is much more diffuse, and not sharply margined (fig. 15).

Structurally similar also, but the fifth wing vein lacks setulae as in *apicipunctata*, and the third antennal segment is not so large in either sex. The hypopygium is similar to that of *apicipunctata*. The inner cross-vein of the wing is sometimes very close to the middle of the discal cell in the male, but usually it is noticeably proximad of it in the female, and the latter sex has the wings hyaline or almost so.

Length, 3.5-4.5 mm.

Type, male, allotype, and five paratypes, Malay Peninsula, Selangor, Bukit Kutu, 3,500 feet, April, 15-19, 1926; four paratypes, Kedah Peak, 3,000-3,500 feet, March, 12-16,

1928 (H. M. Pendlebury). Federated Malay States Museums. Type to be deposited in the British Museum, London.

*Actia subaequalis* sp. n.

This species and the next two are very similar in general appearance and colour, being separable on slight structural characters which may ultimately prove to be mere variations within a single species. However I consider it probable that these segregates represent distinct species.

*Male*.—Head testaceous, face and cheeks with white dust, frontal orbits grey dusted, interfrontalia testaceous yellow, occiput fuscous, with grey dust; antennae brownish-yellow, third segment fuscous except at base on inner side; palpi testaceous yellow. Thorax black, densely grey dusted, shining where abraded, apex of the scutellum testaceous. Abdomen glossy black, bases of the tergites white dusted, the dusting extending posteriorly almost to apices and appearing spotted owing to the lack of dust at base of each discal hair, the denser white basal fascia interrupted in centre. Legs black. Wings greyish hyaline. Calyptrae greyish-white, disc of lower one slightly browned. Halteres yellow.

Frons at vertex a little less than one-third of the head width, either orbit at anterior extremity almost as wide as interfrontalia at same point; ocellar bristles moderately long; hairs descending a little below lowest frontal bristle; third antennal segment not very broad, angular at apex above; palpi club-shaped; proboscis normal. Thorax with four pairs of postsutural dorsocentrals, the lower stigmal bristle long and downwardly directed, sternopleurals 3, no fine hair on the anterior upper angle of the hypopleura. Abdomen subcylindrical, tergites three and four each with six apical bristles. Mid tibia with a submedian anterodorsal bristle; hind tibia with three anteroventral bristles. First wing vein setulose from near base to apex above, and on about the apical third below, third vein setulose from base to well beyond the level of outer cross-vein above, and with one setula at base below, fifth vein bare; inner cross-vein a little beyond middle of discal cell; ultimate section of fifth vein subequal to its penultimate section, and fully twice as long as penultimate section of fourth vein; outer cross-vein about 2.5 as far from bend of fourth vein as from inner cross-vein; sixth vein not attaining margin of wing.

Length, 3 mm.

Type, Cuernos Mts., Negros, Philippine Islands (C. F. Baker). In author's collection.

*Actia monticola* sp. n. (fig. 16a).

*Male and female*.—Similar to the next preceding species, but the sixth wing vein extends to the margin of the wing. Apical venation of wing in figure 16a.

Length, 3-4 mm.

Type, female, allotype, and 2 paratypes, Cuernos Mts., Negros, Philippine Is. (C. F. Baker). Paratypes, 4, Manila, Philippine Is. (W. A. Stanton); 3, Calcutta, India, from *Prodenia littoralis* (Noctuidae), July 1901 (de Niceville). Type series in author's collection, the other material in collection of United States National Museum. One paratype will be placed in the British Museum.

The specimens from India were named *Plectops orbata* Wiedemann by Coquillett. It is impossible to determine Wiedemann's species without an examination of the type specimen; the description agrees well with any of the three species in this segregate, and also with some others of general black colour in the present paper. It is of interest to note Coquillett's reference of the species to *Plectops*, but it does not agree in the essential characters with the genotype of *Plectops*.

*Actia rotundipennis* sp. n. (fig. 16b).

*Female*.—Similar to *monticola*, but the wings are broader and more rounded at apices, and the preapical bend of the fourth vein is more angular (fig. 16b.)

Length, 4 mm.

Type, Cuernos Mts., Negros, Philippine Islands (C. F. Baker). Type in author's collection.

*Actia mimetica* sp. n.

*Female*.—Similar in colouration to *monticola*, but the lower calypter is more distinctly browned on disc. and the frontal orbits and face are yellowish-grey dusted.

Frons at vertex about one-third of the head width, either frontal orbit at anterior extremity over half as wide as interfrontalia; third antennal segment not very broad, rounded at apex, over three times as long as second segment; arista microscopically pubescent; second segment about twice as long as thick; ocellars moderately long; palpi club-shaped; hairs descending slightly below lowest frontal bristle. Thorax with three pairs of postsutural dorsocentral bristles, the lower stigmal bristle undeveloped, sternopleurals 3, no hair on upper anterior angle of hypopleura, and the apical acutellar bristles very small. Third abdominal tergite with six, fourth with four, bristles at apex. Mid tibia with a strong submedian anterodorsal bristle. First wing vein setulose from near base to apex above and on about the apical third below, third vein setulose from base to well beyond level of outer cross-vein above and with one setula at base below; fifth vein setulose

on almost the entire length of discal cell above, bare below; inner cross-vein about two-fifths from base of discal cell; outer cross-vein about midway between inner cross-vein and bend of fourth vein; ultimate section of fifth vein over half as long as penultimate section of fourth vein and about one-third as long as its own penultimate section; sixth vein incomplete.

Length, 3 mm.

Type, Malay Peninsula, Kedah Peak, 3,300 feet, March 25, 1928 (H. M. Pendlebury). Federated Malay States Museums. To be deposited in British Museum, London.

*Actia pendleburyi* sp. n.

*Male and female.*—General habitus and colouration as in *maculipennis*, but the abdomen has black apices to tergites two to four and a black dorsocentral vitta which are connected in the male, and the vitta rather indistinct in female; the wings of the male are slightly clouded apically on costal portion, but lack a distinct cloud or spot.

The third antennal segment is not as long as in *punctipennis*, but it is slightly broader, and its outer, or upper, edge is not straight but slightly rounded in profile, and the fine hairs descend slightly below the lowest frontal bristle; arista pubescent, second segment twice as long as thick. Thorax with four pairs of postsutural dorsocentrals, lower stigmal bristle undeveloped, sternopleurals 3, the lower one hair-like, and a fine hair on upper anterior angle of hypopleura. Abdomen narrowly ovate, the apical tergal bristles strong, third and fourth tergites each with six bristles. Mid tibia with a strong submedian anterodorsal bristle; hind tibia with the anteroventral bristles in two irregular series of about five each. First wing vein setulose from near base to apex above and on about the apical third below, third vein setulose from base to near apex above and with one or two setulae at base below, fifth vein bare; inner cross-vein very slightly proximad of middle of the discal cell; ultimate section of fifth vein about two-thirds as long as penultimate section of fourth and about one-third as long as its own penultimate section; outer cross-vein about midway between inner cross-vein and bend of fourth vein; sixth vein incomplete.

Length, 4.5-5.5 mm.

Type, male, Malay Peninsula, Pahang, Federated Malay States, Sungai Ringlet, 3,500 feet, at light, March 10, 1925; allotype and one female paratype, Kedah Peak, 3,300-3,950 feet and 3,300 feet, March 11, 1928 (H. M. Pendlebury). Federated Malay States Museums. Type to be deposited in British Museum, London.

Named in honour of the collector.

This and the next are the only species in which I have noted the duplicated series of anteroventral bristles on the hind tibia.

***Actia rotundicornis* sp. n.**

*Male*.—Quite similar to *pendleburyi* in habitus and colouration. Third antennal segment fuscous. Humeri and scutellum largely testaceous yellow. Apical dark fasciae on tergites narrow, that on second interrupted on each side of the central vitta, the one on third tergite narrowed but not broken. Apices of hind femora quite broadly infuscated. Wings hyaline.

Third antennal segment quite broad, about three times as long as second, slightly convex above in profile, the apex broadly rounded; hairs descending to middle of parafacials; palpi club-shaped; proboscis normal. Thorax as in *pendleburyi*, abdomen as in that species, but the apical bristles on tergites not so long and strong. Mid tibia with a submedian anterodorsal bristle; hind tibia with an indication of duplication of the anteroventral series of bristles. First wing vein setulose from near base to apex above, and on about the apical third below; third vein setulose from base to near apex above and with one setula at base below; fifth vein setulose to, or beyond, middle of discal cell above, bare below; inner cross-vein close to middle of discal cell; ultimate section of fifth vein subequal to penultimate section of fourth and about half as long as its own penultimate section; outer cross-vein distinctly nearer to inner cross-vein than to bend of fourth vein; sixth vein incomplete.

Length, 4 mm.

Type, Fraser's Hill, Federated Malay States, No. 6 (B. A. R. Gater).

To be deposited in the British Museum, London.

***Actia latipalpis* sp. n.**

*Female*.—This species is almost identical in habitus and colouration with the female of *punctipennis*, the only other species in which the grey dust is conspicuously extended over the entire tergites when seen from in front and with dark dots at the base of each hair. The presence of setulae on the upper side of the first wing vein from a point proximad of the furcation of second and third veins readily distinguishes it however. The apical scutellar bristles in the type specimen are parallel and not cruciate, and the palpi are more widened than in *punctipennis*.

Length, 4.5 mm.

Type, Malay Peninsula, Kedah Peak, 3,000-3,300 feet, March 12, 1928 (H. M. Pendlebury). Federated Malay States Museums. To be deposited in the British Museum, London.



*Actia dubia* sp. n.

*Female*.—Strikingly similar to *pendleburyi*, but the abdomen is mostly grey dusted on dorsum with the same spotted appearance, though not so conspicuous as, the next preceding species, the epistome is a little produced, the palpi are wider, the fifth vein is setulose above to about middle of discal cell, and the anteroventral setulae on the hind tibia are in a single series.

Length, 5 mm.

Type, Malay Peninsula, Selangor, Bukit Kutu, April 17, 1926 (H. M. Pendlebury). Federated Malay States Museums. To be deposited in British Museum, London.

*Actia (Pseudactia) hirticeps* sp. n. (fig. 17).

*Male*.—Face and cheeks testaceous, densely white dusted, interfrontalia reddish-brown, frontal orbits dark grey, with dense grey dust, more brownish above; ocellar triangle, vertex, and upper occiput, fuscous, densely grey dusted; antennae reddish-brown, third segment fuscous above and on entire outer side; aristae dark brown; palpi testaceous yellow. Thorax black, shining, rather densely dark grey dusted. Abdomen glossy black, apices of tergites narrowly testaceous, their bases very narrowly grey dusted. Legs black, fore coxae, trochanters, and tibiae, brownish or reddish. Wings hyaline. Calyptrae white, disc of lower one brownish. Halteres yellow.

Frons at vertex a little less than one-third of the head width, widened anteriorly; ocellar bristles strong; postverticals very small; interfrontalia over 1.5 as wide as either orbit at anterior extremity, each orbit with two outer forwardly-directed bristles; a series of fine hairs begins about the middle of each orbit and continues down the parafacials to lower level of eyes, becoming longer below; cheek not as high as width of third antennal segment, the latter over twice as long as wide; arista about as long as third antennal segment, basal segment short, second segment about five times as long as thick and about half as long as third segment; palpi well developed, club-shaped; proboscis short; head in profile as figure 17. Thorax with four pairs of postsutural dorsocentrals, the lower stigmatal represented by a fine setula. Second visible tergite with two median apical bristles, third with a series of six, and fourth with four apical bristles. Legs normal, anterodorsal bristle present on mid tibia. First wing vein setulose on apical third above, third vein setulose from base to about level of outer cross-vein above, and with a basal setula below; inner cross-vein a little proximad of middle of discal cell; ultimate section of fifth vein sub-equal to penultimate section of fourth vein and about half as long as its own penultimate

section; outer cross-vein a little nearer to inner cross-vein than to bend of fourth vein, the latter evenly rounded; sixth vein not attaining margin of wing.

Length, 3 mm.

Type, Malay Peninsula, Kedah Peak, 3,000 feet, March 18, 1928 (H. M. Pendlebury). Federated Malay States Museums. To be deposited in British Museum, London.

This subgenus resembles the genus *Bigonochaeta* Rondani, but in the latter the parafacials are strongly bristled, there are two quite strong divergent pairs of short bristles behind the ocellars, and the basal segment of the arista is about as long as the second one. I have used in this comparison a European example of the genotype of *Bigonochaeta* in the collection of the United States National Museum.

### Genus *Neoplectops* gen. nov.

This genus resembles some of the species of *Actia* dealt with in this paper, but it can be readily distinguished from any of them by the presence of a third sternopleural bristle in the upper series, making three above and one below, the latter and the additional (median) upper one weaker than the others, by the lack of the weak pair of apical scutellar bristles, and the stronger bristled posterior portion of the cheeks. It will also be noted that the position of the arista is much farther from the base of the third antennal segment in this genus and *Acronarista* Townsend, the latter a New World genus with fissicorn third antennal segment (fig. 4b), than in *Actia*. I can detect no palpi in the type, and the first wing vein is setulose above and below an apical third or more of its extent, both of which characters distinguish it from *Plectops* Coquillett, to which genus it runs in Williston's Manual of North American Diptera. The lower stigmatal bristle is quite well developed and downwardly directed in this genus and *Plectops* as well as in a number of species of *Actia* and in all three there are no well developed discal bristles on abdomen except in the genus at present described, and in it they are confined to the fourth tergite. I can detect no setulae on the sides of the prosternal plate in *Neoplectops* while there are such in *Plectops* and *Actia*. Genotype, the following species.

*Neoplectops nudibasis* sp. n. (figs. 18, 19).

*Male*.—Entirely black, shining. Head with pale grey dusting. Thorax grey dusted, slightly brownish just in front of scutellum, mesonotum with four inconspicuous black vittae anteriorly. Abdomen glossy, with white dusted bases to tergites, interrupted in centre and widest on each side of the break. Wings greyish hyaline. Calyptrae pale brown. Halteres brown.

Frons at vertex fully one-third of the head width, either orbit at anterior extremity as wide as interfrontalia; postverticals short, rather widely spaced and parallel; ocellars moderately long; fine hairs not descending below lowest frontal bristle; profile of head as in figure 18. Thorax with four pairs of postsutural dorsocentral bristles, the lower stigmatal long, four sternopleurals, three hypopleurals and no fine hair on upper anterior angle of hypopleura; scutellum as figure 19. Second tergite without distinct apical central bristles, third with a central apical pair of bristles which are widely separated from the one on each lateral curve, fourth with a discal and apical transverse series of bristles. Fore tibia with the anterodorsal series of short bristles quite well developed, mid tibia with a long anterodorsal submedian bristle, hind tibia as in *Actia*. Third wing vein with about three bristles at base above and one at base below; inner cross-vein slightly proximad of middle of discal cell; outer cross-vein distinctly nearer to inner cross-vein than to bend of fourth vein; ultimate section of fifth vein as long as penultimate section of fourth vein and about half as long as its own penultimate section; sixth vein incomplete.

Length, 4.5 mm.

Type, Pahang, Federated Malay States, Kuala Teku, Jungle, 500—1,200 feet, November 25, 1922 (H.M. Pendlebury). Federated Malay States Museums. To be deposited in the British Museum, London.

### Tribe Hypochaetini.

#### Genus *Hypochaetopsis* Townsend.

This genus belongs to a small group of genera in which the eyes are hairy, the ocellar bristles are erect and more or less conspicuously curved backward at tips, the face recedes below causing the length of head at vibrissal angle to be less than that at bases of antennae, the facial ridges are strongly bristled to well above middle, the third antennal segment is much longer than second, the palpi well developed, arista subnude, and the first posterior cell of wing ends near the wing tip.

I have used a tribal name for the group, but merely as a matter of convenience rather than as an indication of comparative status. Aldrich has recently dealt with the group\*

The species before me which I place in *Hypochaetopsis* agrees very closely with the type species of the genus which is represented by the type specimen in the United States National Museum, and with which I have compared it. The abdominal bristles are shorter in the Oriental species, and

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\* Proc. Ent. Soc. Washington, Vol. 28, p. 143 (1928).

it is more intensely black than *chaetosa* Townsend, which is from Peru. I can see no reason why the two species should not be referred here.

***Hypochaetopsis cinereofrons* sp. n. (figs 20, 21).**

*Male*.—Black. Head densely whitish grey dusted, the frons entirely so when seen from in front, the interfrontalia less so when seen from above; antennae black; palpi brownish-yellow. Thorax quite densely grey dusted, mesonotum shining, and with four quite noticeable black vittae, the submedian pair slender, the sublaterals wider. Abdomen glossy black, with narrow white dusted bases to the tergites which are almost broken in centre. Legs black. Wings hyaline, more or less browned on costal half. Calyptrae yellowish-white. Halteres yellow.

Frons at vertex about one-fourth of the head width, orbits hardly differentiated, ocellars long, postverticals short and fine, outer verticals undeveloped, inner pair long and strong; profile as figure 20; cheek with one or two bristles behind; basal fourth of arista markedly thicker than remainder. Thorax with four pairs of postsutural dorsocentrals, prosternum bare, sternopleurals 2, a weak hair on upper anterior angle of hypopleura, the hypopleural bristles five or six in number; apical bristles on scutellum not as long as the laterals, cruciate. Abdomen subcylindrical, with discal bristles on all tergites but first; hypopygium with the superior forceps long, slightly curved, and sharply pointed at apices (fig. 21). Fore tibia with the anterodorsal series of short bristles well developed; mid tibia with a long anterodorsal bristle near middle. Third wing vein with two or three bristles at base above and below, the other veins bare; inner cross-vein close to middle of discal cell; outer cross-vein about three-sevenths of the distance from inner cross-vein to bend of fourth vein; ultimate section of fifth vein a little shorter than penultimate section of fourth and over one-third as long as its own penultimate section; sixth vein incomplete. Lower calypter widened behind, not transverse on apical margin.

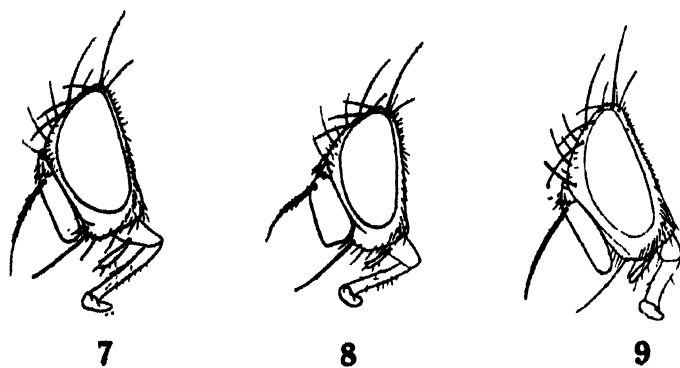
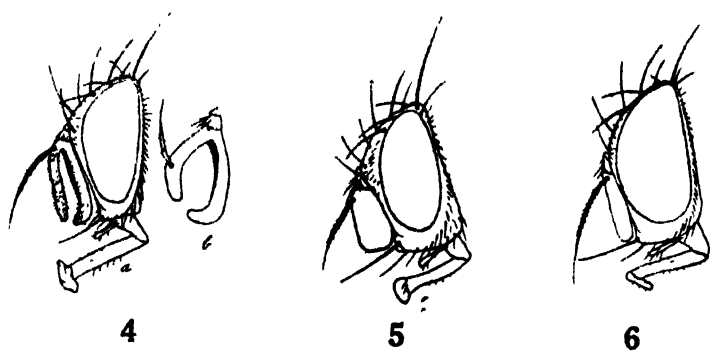
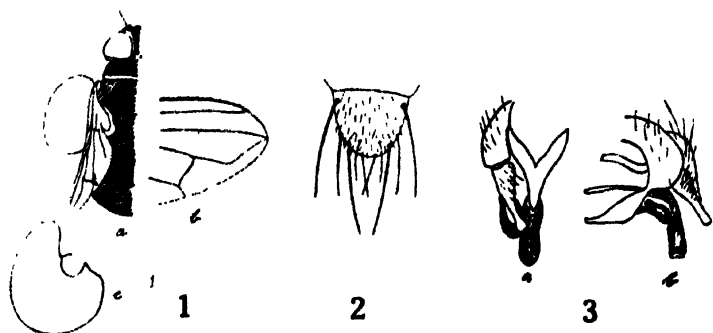
Length, 6.5 mm.

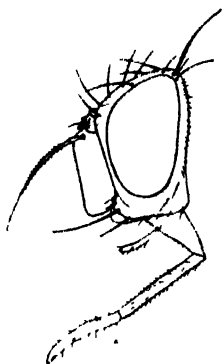
Type, and one paratype, Malay Peninsula, Selangor, Bukit Kutu, 3,500 feet, April 16 and 20, 1925 (H. M. Pendlebury). Federated Malay States Museums. Type to be deposited in the British Museum, London.

**Explanation of Figures.**

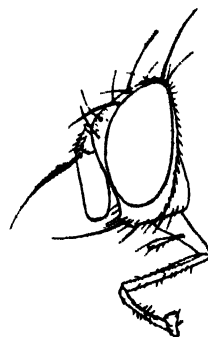
- Fig. 1. *Tetrapteromyia klossi*; a, dorsal view, one half; b, apex of wing, c, lower calypter.  
„ 2. *Actia uniseta*; scutellum from above.  
„ 3. „ *apicipunctata*; hypopygium of male, a, from behind, one side, b, from side.

- Fig. 4a. „ *uniseta*; head from the side; b, *Acronarista mirabilis*, third antennal segment.
- „ 5. „ *laticornis*; head from the side.
- „ 6. „ *angustifrons*; head from the side.
- „ 7. „ *selangor*; head from the side.
- „ 8. „ *magnicornis*; head from the side.
- „ 9. „ *aberrans*; head from the side.
- „ 10. „ *siphonosoma*; head from the side.
- „ 11. „ *completa*; head from the side.
- „ 12. „ *punctipennis*; apex of wing.
- „ 13. „ *punctipennis*; head from the side.
- „ 14. „ *apicipunctata*; apex of wing.
- „ 15. „ *maculipennis*; wing.
- „ 16a. „ *monticola*; same, apex of wing; b, *rotundipennis*.
- „ 17. „ *hirticeps*; head from the side.
- „ 18. *Neoplectops nudibasis*; head from the side.
- „ 19. „ ; acutellum from above.
- „ 20. *Hypochaetopsis cinereofrons*; head from the side.
- „ 21. „ ; hypopygial forceps of male from the side.





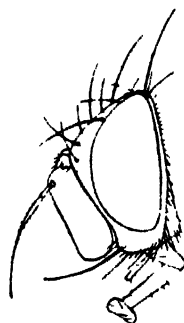
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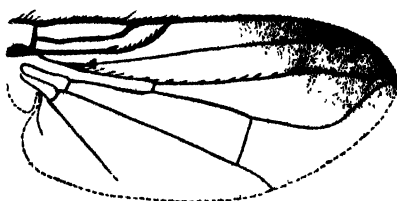
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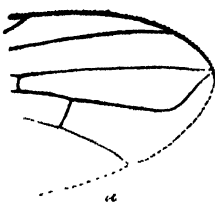
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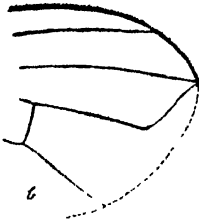
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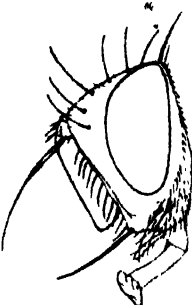
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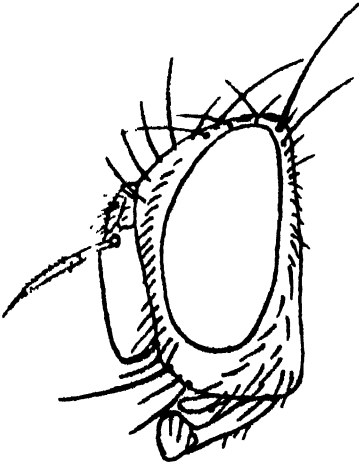
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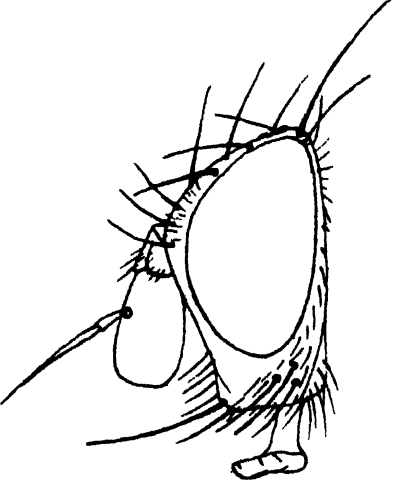
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## VIII. NEW STAPHYLINIDAE FROM THE MALAY PENINSULA.

(Second Paper).\*

By MALCOLM CAMERON, M.B., R.N., F.E.S.

### OXYTELINAE.

#### *Trogophloeus malayanus* sp. n.

In build and colour similar to *T. niloticus* Er., but much smaller (1.5 mm) and narrower, the head black, rather shining, slightly broader than the thorax, the eyes large occupying practically the whole side of the head as in *niloticus*, very finely and very closely punctured. Antennae shorter than in *niloticus*, the fifth to tenth joints transverse, the first three joints yellow, the following reddish. Thorax reddish-brown, moderately shining, slightly broader than long, on each side of the middle with a narrow elongate impression, diverging in front, very finely and very closely punctured. Elytra yellow, rather shining, scarcely infusate about the scutellum, fully half as long again as the thorax, very finely, closely, punctured. Abdomen black, greasy lustrous, very finely, closely, punctured, finely grey pubescent throughout. Legs yellow.

Malay Peninsula. Kedah; Catchment Area, near Jitra. at light. Unique. In my collection.

#### *Oxytelus* (*Anotylus*) *malayanus* sp. n.

Shining; head black, thorax yellowish-red, elytra and abdomen reddish-yellow, the latter a little infusate before the apex. Antennae red. Legs yellow, Length 2.5 mm.

var. *ruficeps*. var. n. Head red.

In build resembling *O. nitidifrons* Woll., but much smaller and less robust. ♂: head transversely subquadrate, the eyes large, their curve greater than that of the post-ocular region, the front margin rounded between the yellow antennal tubercles, broadly impressed, shining and impunctate, before the middle of the base with a fovea, the intra-ocular crest curved inwards along the base, the sculpture consisting of close, elongate punctures. Antennae with the fourth joint moniliform the fifth to tenth transverse, the penultimate nearly twice as broad as long. Thorax strongly transverse, trapezoidal, the posterior angles obtuse, the disc trisulcate, the sulci nearly straight, equal, near the lateral margin slightly impressed, puncturation rather coarse and rather close. Elytra scarcely longer than the

\* One new genus, one new variety, and thirty-five new species were described by Dr. Cameron in the Journal F.M.S. Museums, Vol. XIV, Parts 3 & 4, pp. 436-452, July 1929.

thorax, striate punctate. Abdomen practically impunctate, glabrous. Seventh ventral segment in the middle a little produced and rounded, broadly emarginate on either side.

Singapore. Selangor; Kuala Lumpur.

#### PAEDERINAE.

##### *Scimbalium suturale* sp. n.

Head black, shining; thorax shining pitchy brown, the base obscurely reddish; elytra less shining, pitchy black, the sutural margin narrowly and obscurely reddish: abdomen pitchy-black, more shining, the posterior half of the seventh and whole of the eighth segments reddish-yellow. Antennae, palpi and legs reddish-yellow. Length 6.5 mm.

In size and build very similar to *S. pubipenne* Fairm. and in colour and lustre also somewhat similar to the darker forms of that species; the antennae are however longer, the head a little shorter and broader, the thorax a little broader, extremely finely and much more closely punctured, the elytra a little longer, more finely and more closely punctured. In other respects similar to *pubipenne*.

Malay Peninsula. Kedah; Alor Star. Unique. In my collection.

#### STAPHYLININAE.

##### *Philonthus pendleburyi* sp. n.

Shining, the fore parts bronze-black, the abdomen black. Thorax with a dorsal series of five or six punctures (six on right, five on left). Antennae with the first, third and apex of the second joint black, the base of the second and fourth to eleventh joints reddish yellow. Palpi pitchy, the last joint yellow. Legs pitchy, the tarsi reddish. Length 10 mm.

In build resembling *P. rectangulis* Shp. but differing in the colour, much more coarsely punctured elytra etc. ♂: head large, quadrate, as broad as the thorax, the eyes large, a little longer than the temples, these with the posterior angles briefly rounded; intra-ocular punctures equidistant, on each side of the vertex with a puncture and another at the postero-internal border of the eye, the base and temples closely, moderately finely, punctured; ground sculpture fine and wavy. Antennae with the third to ninth joints longer than broad, gradually decreasing in length, the tenth about as long as broad, the eleventh scarcely longer. Thorax about as long as broad, the sides straight, slightly retracted behind, on the right side with six punctures, the third more remote from the second than the following from each other, or the left with five punctures the fourth and fifth widely separated from each other, the ground sculpture much weaker than on the head. Elytra as long as the thorax, closely, rather coarsely, rugosely punctured. Abdomen with

the basal lines straight, less finely but almost as closely punctured as *rectangulus*. Anterior tarsi strongly dilated: sixth ventral segment with an acute triangular excision, the edges levelled.

Malay Peninsula. Negri Sembilan; Port Dickson. Unique. In my collection.

**Staphylinus auropubescens** sp. n.

Build of *S. maculipennis* Kr., colour of the fore-parts almost as in *S. indicus* Kr., but with the elytra more mottled with brown and longer golden pubescence at the shoulders, sides and especially at the postero-external angles where it forms a patch as in *maculipennis*; the abdomen is black as in that species and very similarly punctured and the arrangement of the black and yellow pubescence is similar, but the latter is more golden and rather thicker. The head is of the same shape as *maculipennis* with similar large eyes and short temples and scarcely different sculpture, in the middle of the vertex with very short impunctate line, the pubescence golden: antennae with the first three and last two joints rufoferruginous, the rest blackish. the structure as in *maculipennis*: thorax in build and sculpture scarcely differing from *maculipennis*, with a very short median impunctate line behind, its colour however is very similar to *indicus* being brown with a slight metallic reflex mottled with obscure reddish-brown and rather closely covered with golden pubescence: Scutellum black, velvety. The elytra are very similar in colour to the thorax but less metallic, the sculpture as in *maculipennis*. Abdomen very similar in sculpture and pattern to *maculipennis*, but the median and lateral patches at the base of the segments are more marked and golden. Legs reddish-yellow. Length 13 mm.

Malay Peninsula. Selangor; Bukit Kutu. Kedah; Catchment area, near Jitra.

1930.

**Staphylinus subchalcus** sp. n.

Closely allied to *S. chalcus* Bernh., but the eyes are larger and the temples shorter, the puncturation of the head not quite so coarse, the antennae (which are similarly coloured) are a little more slender, the penultimate joints less transverse, the thorax is distinctly less coarsely and more closely punctured, the elytra are dark reddish, mottled with brown, the colour and pattern of the abdomen scarcely differs from *chalcus*. Legs yellow. Length 12 mm.

Malay Peninsula. Pahang; Bentong (Cameron).  
**Staphylinus rufipennis** sp. n.

In size and build similar to *S. chalcus* Bernh., but differently coloured, the temples a little longer and the puncturation of the head and thorax less coarse. Head black,

shining, not rugose, with close umbilicate punctures and a fine black pubescence. Antennae formed as in *chalceus*, black, the first joint yellow, the eleventh wanting. Thorax formed as in *chalceus*, black, less shining than the head, similarly but more finely punctured, with short black and long yellowish pubescence, in the middle before the space with an impunctate space continued almost to the anterior margin as a narrow line. Scutellum black, velvety. Elytra bright yellowish-red, rather shining, very finely and rather closely punctured, with long golden pubescence especially evident along the posterior margin. Abdomen with the first three visible segments red, shining; along the middle shining blue-black, the puncturation on these segments very fine and rather sparing, the rest of the abdomen shining blue-black, the puncturation on the fourth and fifth segments much coarser and closer, the pubescence at base of the first three segments not very dense, yellow; at the base of the fourth and fifth segments much denser and more silvery forming a narrow transverse fascia, besides this pubescence numerous black hairs are present. Legs reddish-yellow, the coxae black, the anterior borders of the anterior and middle femora blackish. Length 12 mm.

♂: sixth ventral segment with acute triangular impression, its base with small arcuate emargination.

Malay Peninsula. Kedah; Catchment Area, near Jitra. Unique. In my collection.

### ALEOCHARINAE.

#### *Astilbus semicyaneus* sp. n.

Head very shining black; thorax and elytra shining, cyaneous, the shoulders of the latter yellow; abdomen very shining pitchy, the lateral margins variegated with yellow. Antennae with the first, second and eleventh joints reddish-testaceous, the rest reddish-brown. Legs yellow. Length 2.5 mm. Of the facies of *A. laevicauda* Bernh. but smaller and less robust and in other respects quite different. Head transverse, with a few very fine punctures each with a black seta, the eyes large. Antennae longer than in *laevicauda*, the penultimate joints fully as long as broad. Thorax a little broader than long, the sides rounded in front, sinuate and retracted behind with three long black setae, before the scutellum with a fovea and an impressed line extending therefrom to the anterior border, the puncturation very fine, rather close and asperate along the middle, but very sparing elsewhere. Elytra scarcely as long as the thorax, transverse, closely and rather finely punctured. Abdomen very shining, practically glabrous and impunctate.

Malay Peninsula. Kedah; Catchment Area, near Jitra. Unique. In my collection.

**Orphnebius politus** sp. n.

Shining, black, the third, fourth, seventh and eighth abdominal segments dark ferruginous red. Antennae with the first eight joints yellow, the rest black. Legs yellow, the femora infuscate. Length 2.3 mm. Head transversely suborbicular, narrower than the thorax, the eyes very large, the postocular space short; extremely finely and very sparingly punctured. Antennae rather slender, the third to fifth joints a little longer than broad, decreasing in length, the sixth moniliform, seventh to tenth a little transverse gradually increasing in width, the eleventh as long as the two preceding together. Thorax transverse, the sides almost straight, a little retracted towards the front, sparingly, scarcely perceptibly punctured. Elytra transverse, as long as but broader than the thorax, extremely finely, very sparingly punctured. Abdomen scaphoidal, the side margins strongly raised and furnished with short black setae, the seventh segment rather coarsely, closely punctured on the anterior half, closely striate on the posterior half, the eighth with a few fine punctures, the other segments quite glabrous and impunctate.

West Coast of the Malay Peninsula; Langkawi Islands, Unique. In my collection.

**Zyras rufithorax** sp. n.

Shining, head, elytra and abdomen (except the base and apex) black, thorax and scutellum red, third, fourth, sides of the fifth, posterior margin of the seventh and whole of the eighth segment, reddish testaceous. Antennae blackish, the first three joints yellow. Legs yellow. Length 7 mm.

In facies somewhat resembling *Z. termitaria* Wasm., but differing in all other respects. ♂: head narrower than the thorax, short, transverse, the eyes large, the post-ocular region very short, the front between the antennal tubercles convex, finely coriaceous and impunctate, the rest of the surface more strongly coriaceous and with a few rather small scattered punctures. Antennae slender, compressed, the second joint fully half as long as the third, the penultimate joints triangular about as broad as long, the eleventh as long as the two preceding together. Thorax half as broad again as long, the sides in front feebly rounded, distinctly retracted and very slightly sinuate behind; before the scutellum with a fovea continued as a fine impressed line nearly to the anterior margin, near the side margins lightly obliquely impressed, on either side of the median line behind the middle with a large puncture, more externally at the level of the middle with another, on the anterior margin close to the middle on each side with a third, along each side of the median line and in the lateral impressions with a few fine punctures, ground sculpture very fine, coriaceous.

Elytra about as long as the thorax, transverse, obliquely impressed before the postero-external angles, moderately coarsely, rather closely punctured rather strongly coriaceous. Abdomen practically impunctate and glabrous, finely coriaceous, the third segment produced a little backwards in the middle and furnished with a large, slightly convex tubercle, eighth segment broadly feebly emarginate. The ♀ differs from the ♂ in the more finely punctured and less coriaceous head, more finely punctured thorax and elytra and absence of tubercle on the third abdominal segment and less distinct median thoracic line. The larger punctures on thorax are also less marked.

Malay Peninsula. Kedah; Catchment Area, near Jitra. Patalung (Peninsular Siam).

*Zyras sparsipennis* sp. n.

Near the preceding but differing in the following respects: the head is broadly impressed on the vertex with on each side of the impression a group of five or six small punctures, elsewhere extremely sparingly, scarcely perceptibly punctured, the ground sculpture very fine, the thorax is less widened in front, the sides retracted but quite straight behind and without trace of oblique lateral impression, the larger punctures are similarly disposed, the other puncturation is extremely fine and scanty, the elytra are pitchy brown, obscurely lighter at the base, suture and apical margins, each disc with about eight or nine moderate punctures, three of them situated along the suture, besides them with an extremely fine and sparing puncturation which however is much closer on the reflexed sides, the ground sculpture fine. Abdomen with the third and fourth segments entirely the posterior margin of the rest reddish-testaceous, extremely finely and very sparingly punctured, coriaceous, each segment on either side with four to six fine setiferous punctures: eighth segment practically truncate.

Kedah; Catchment Area, near Jitra. Unique. In my collection.

IX. STAPHYLINIDAE FROM  
BRITISH NORTH BORNEO,  
WITH DESCRIPTIONS  
OF NEW SPECIES.

By MALCOLM CAMERON, M.B., R.N., F.E.S.

[This is an account of the Staphylinidae obtained by Mr. H. M. Pendlebury and myself during the collecting visit to British North Borneo undertaken by the Raffles Museum, Straits Settlements, and the Museums of the Federated Malay States in 1927. Bettotan and Samawang are places about twenty-five miles west by north and twenty-two miles west by south, respectively, of Sandakan. C. Boden Kloss].

OXYTELINAE.

*Eleusis fusciceps* Kr.

Bettotan, August 25th.

*Eleusis mjobergi* Cam.

♀. Samawang, July 14th.

*Priochirus doriae* f. *minor* Heller.

Bettotan, September 3rd.

*Priochirus guttularis* Bernh.

Bettotan, September 3rd.

*Priochirus minutus* Cast.

Bettotan, September 2nd.

*Paralispinus nitidissimus* Bernh.,

*Lispinus globiceps* Cam.

Bettotan, July 25th, August 5th.

*Lispinus madurensis* Bernh.

Bettotan, July 25th.

*Lispinus minutus* Cam.

Bettotan, July 25th.

*Lispinus unipunctatus* sp. n.

Black, shining, the posterior margin of the 7th and whole of the 8th segment reddish. Antennae red. Legs yellowish-red. Length 3.5 mm. Size and build of *L. coarcticollis* Kr., but differing in the following respects: the antennae are shorter and stouter, the penultimate joints more transverse, the lateral thoracic impression is deeper and longer, the puncturation of the thorax a little more sparing, that of the elytra a little less fine and each has in the middle a large setiferous puncture which is not found in *coarcticollis*, the puncturation of the abdomen is more sparing.

Sarawak; Mt. Matang (Bryant) (Type). North Borneo; Bettotan near Sandakan, July 25th. Type in my collection.  
*Lispinus borneensis* sp. n.

Subdepressed, shining; head and abdomen black, the apex of the latter reddish testaceous, thorax and elytra rufo-castaneous. Antennae and legs reddish testaceous. Length 3.5 mm.

Near *L. malayanus* Cam., but differently coloured, more shining, less strongly coriaceous, less finely punctured and the elytra with a larger puncture on each before the middle. The thorax has on each side on the anterior margin a more conspicuous puncture as in *malayanus* but the larger puncture in the median impression is less evident owing to the closer puncturation of this area.

North Borneo; Bettotan near Sandakan. Unique. In my collection.

***Phloeonomus chlorizans* Fol.**

Bettotan, August 23rd.

***Phloeonomus* (s. str.) *crenicollis* sp. n.**

Head black, nearly opaque, coriaceous, impunctate, along the middle less coriaceous and a little shining. Antennae rather slender, the first four joints reddish-yellow, the 4th to 10th transverse. Thorax transverse, black or pitchy with the base and side margins narrowly and obscurely lighter, the sides rounded in front, retracted behind and finely crenulate, on each side of the middle with a long deep opaque coriaceous fovea, the margins less strongly coriaceous and a little shining, in front and internal to each with a less coriaceous, more shining superficially punctured space, against the lateral margin with a deep coriaceous fovea. Elytra about a half longer than the thorax, slightly shining, pitchy or yellowish-brown with rather coarse but superficial rugulose punctures, coriaceous. Abdomen pitchy greasy lustrous, very finely, moderately closely punctured, coriaceous. Legs yellow. Length 1.3 mm.

North Borneo; Bettotan near Sandakan, August 23rd.

***Phloeonomus* (s. str.) *germanus* sp. n.**

Smaller (1.2 mm.) and narrower than the preceding, the antennae more slender, the head and thorax entirely opaque, black, coriaceous, the sides of the latter not crenulate, the median foveae less deep, their margins not more shining than the rest of the surface, the elytra more finely, (but rugulose) punctured, black, nearly as dull as the fore-parts.

North Borneo; Bettotan near Sandakan, August 23rd.

***Oxytelus ferrugineus* Kr.**

Bettotan, July 24th (immature).

***Bledius lucidus* Shp.**

Bettotan, August 24th.



**PAEDERINAE.****Oedichirus pendleburyi** sp. n.

Shining black, the posterior margin of the elytra and apex of the abdomen narrowly and indeterminately reddish-yellow. Antennae and legs pale yellow, the knees scarcely infusate. Length 9.5 mm.

Readily recognised by the colour and the long practically parallel elytra which are much longer than in any other Oriental species. Head rather coarsely and closely punctured. Antennae long and slender, all the joints much longer than broad. Thorax longer than broad, narrowed behind, on each side in front with a smooth reddish brown callus, the rest of the surface very coarsely, closely, serially punctured. Elytra distinctly longer and a little broader than the thorax, almost parallel, coarsely and closely punctured. Abdomen elongate, rather coarsely and closely punctured, more finely and more sparingly behind. Anal styles pitchy.

North Borneo; Samawang near Sandakan, July.

**Pinophilus orientalis** Cam.

Samawang, July 5th.

**Pinophilus borneensis** Fol.

Samawang, July 15th.

**Pinophilus picticornis** Kr.

Bettotan, August 5th.

**Pinophilus bettotanus** sp. n.

Similar in size (9 mm.), build and colour to *P. eppelsheimi* Bernh., and only differs in the sculpture which is more uniform and much coarser and closer on the head and thorax, finer on the elytra and rather closer on the abdomen.

One ♀ example.

North Borneo; Bettotan near Sandakan. Type in my collection.

**Paederus fuscipes** Aut.

Bettotan, July 27th.

**Scopæus limbatus** Kr.

Bettotan, July 24th.

**STAPHYLINAE.****Oligolinus discalis** Cam.

Samawang, July 14th.

**Philonthus tardus** Kr.

Kudat, September 17th.

**Philonthus sarawakensis**

Bettotan, July 30th, August 1st.

**Philonthus sericatus** sp. n.

Shining; head, thorax and abdomen black, the thorax sericeous with dorsal row of 5 to 7 large punctures<sup>1</sup>; elytra bronze green. Antennae black, the first joint reddish yellow, the 9th to 11th obscurely reddish. Legs yellow, tibiae infusate. Length 7 mm.

♀: head in shape similar to *P. sarawakensis* Bernh., but the thorax is broader and more parallel-sided. Head transversely sub-orbicular, as broad as the thorax, the eyes very large, the postocular region short, rounded and retracted to the neck, the mandibles long and prominent, the median interocular punctures more separated from each other than from the lateral ones, behind the eyes with a few scattered punctures, the ground sculpture fine, wavy, more or less transverse. Antennae with the penultimate joints longer than broad, the 10th only slightly so, the 11th longer than the 10th. Thorax as long as broad, the sides straight and parallel, on either side of the dorsal series with three others in a curved row, the ground sculpture as on the head. Scutellum finely and closely punctured. Elytra a little longer and broader than the thorax, finely and closely punctured, with fine, rather long yellowish pubescence. Abdomen finely and rather closely punctured, at the base of the first three segments less finely and more closely, the pubescence yellow. Anterior tarsi dilated. First joint of the posterior tarsi about as long as the last.

North Borneo; Bettotan near Sandakan.

A single ♀. In my collection.

***Philonthus hybridus* sp. n.**

Black, shining, the elytra scarcely metallic, the extreme sutural and extreme reflexed margins reddish. Thorax with dorsal series of 5 punctures. Antennae black, the 1st joint yellow. Legs yellow. Length 4 mm. Intermediate between *P. minutus* and *P. crassicornis*; the head broader than in *minutus* but with similarly constructed antennae, the thorax parallel-sided as in *crassicornis*; the head even in the ♂ not so broad as in *crassicornis* ♀; the puncturation of the elytra is much coarser than in either of these species. ♂: head a little longer than broad, short oval, the eyes large, the postocular region gently rounded and retracted to the neck and about as long as the diameter of the eye; median interocular punctures widely separated, behind the eyes with a few punctures, ground sculpture wanting. Antennae as in *minutus*. Thorax a little longer than broad, the sides parallel, the 5 dorsal punctures moderate, equidistant, externally with a curved row of 3 punctures; ground sculpture wanting. Scutellum with a few moderately fine punctures. Elytra scarcely longer than the thorax, much more coarsely

<sup>1</sup> In the unique type the row consists of 7 punctures on the right side and 5 on the left.

and a little less closely punctured than in *crassicornis*, finely grey pubescent. Abdomen rather finely and closely punctured and pubescent in front, more finely and sparingly behind. Anterior tarsi dilated, posterior with the 1st joint scarcely as long as the last. 6th ventral segment triangularly excised.

North Borneo; Bettotan, August 20th. Unique. In my collection.

**Staphylinus aeneoacreus sp. n.**

Head and thorax shining green bronze; elytra subopaque reddish-brown, the shoulders and reflexed margins reddish-ochraceous, with patch of golden pubescence about the middle of the outer border and another near the postero-external angles; abdomen pitchy black, the first four (visible) segments bifariate. Antennae black, the 1st joint yellow, the 10th and 11th reddish. Legs yellow. Length 11 mm. Very near *S. chalceus* Bernh., of the same build, but the antennae thinner, the head and thorax of a brighter green bronze, more finely and more closely punctured, more finely and rather more thickly covered with golden pubescence; scutellum black, velvety; elytra darker on the disc with small patches of short golden pubescence, one behind the shoulder, one about the middle of the lateral margin and another near the postero-external angle, so that a marbled appearance is produced, the puncturation and ground sculpture similar to *chalceus*, the former fine the latter dense and coriaceous, the general pubescence yellow and moderately close; abdomen on the first four visible segments with a bifariate velvety patch at the base of each and a triangular patch of golden pubescence in the middle, towards the lateral margin with another; 5th segment in the middle with a fine line of golden pubescence at the sides with a broader patch; besides these spots with longer scattered yellow hairs.

♂ : unknown.

North Borneo; Bettotan, July 27th. Unique. In my collection.

**Staphylinus aeneipennis sp. n.**

Head and thorax black, shining with distinct bluish or bluish-green reflex; elytra thickly covered with greenish-golden pubescence except along the reflexed margin, a small spot behind the humeral angle, another on the lateral border before the posterior angles and sometimes one on the posterior margin which are covered with black pubescence; abdomen black, iridescent, the base of the first four segments bifariately tomentose, in the middle line and at the sides with patches of grey pubescence; 5th segment with the central and lateral areas of pubescence united to form a transverse fascia. Antennae black. Legs black, femora yellow. Length 11 to 14 mm. Build of *S. chalceus* Bernh.,

the head and thorax very similarly punctured but much less pubescent, the antennae similarly built. Head transversely sub-quadrate, narrower than the thorax, very slightly widened behind, the temples straight, much shorter than the eyes, the posterior angles briefly rounded, coarsely and close punctured, sparingly grey pubescent. Antennae with the penultimate joints about twice as broad as long. Thorax as long as broad, the sides straight, slightly converging in front, the posterior angles broadly rounded, at the base in the middle with a small shining plaque, the puncturation and pubescence as on the head. Scutellum black, velvety. Elytra scarcely as long, but a little broader than the thorax, finely, rather sparingly punctured, strongly coriaceous, covered with a short dense greenish-golden pubescence on the disc, interspersed with longer yellow hairs, the reflexed margins and areas enumerated above covered with thick black pubescence. Abdomen rather sparingly and finely punctured, except along the posterior margin of the 5th segment which is very finely and closely punctured.

♂ : 6th ventral segment with a small arcuate excision.

Sarawak, Mt. Matang (Bryant) Type. North Borneo; Samawang, near Sandakan, August 12th and 13th. S. E. Borneo; Martapura near Bandjermasin (Doherty). Type in my collection.

***Naddia borneensis* sp. n.**

Black, moderately shining, the elytra bronze-black with scattered orange coloured pubescence; abdomen with the first three abdominal segments in the middle with thick black tomentose pubescence (scarcely bifariate), at the sides with patch of yellow pubescence, 5th segment on each side at the margin with a small patch of silvery pubescence. Antennae with the base black (the rest wanting). Legs black. Length 11 mm.

Smaller than *N. vethi* Bernh., with more deeply emarginate, less coarsely sculptured head, shorter, more transverse thorax with the sides evenly rounded from base to apex and less coarsely sculptured, abdomen without orange red pubescence, the silvery patch on the 5th segment much thicker. Head quadrate, slightly broader than the thorax, the temples longer than the eyes, slightly diverging behind, the base deeply and broadly emarginate, the posterior angle produced backwards, the apex briefly rounded, the sculpture consisting of rather coarse more or less longitudinal confluent rugae, the interspaces with close umbilicate punctures. Thorax slightly transverse, the sides gently rounded and gradually retracted behind, the posterior angles broadly rounded, the anterior angles obtuse, the anterior margin obliquely emarginate to the neck, in the middle before the base with a smooth shining line, sculpture as on the head,

but in front with the rugae more or less transverse, behind more or less longitudinal. Scutellum black, velvety. Elytra (from the base) a little longer and a little broader than the thorax, with coarse, close, confluent punctures and grey and black pubescence, interspersed with orange red hairs. Abdomen very finely and closely punctured with a fine close black pubescence in addition to the pubescence above described.

♂ : unknown.

North Borneo; Bettotan. Unique. In my collection.

**Naddia aeneipennis** sp. n.

Moderately shining, black, the elytra bronze-green. Antennae and legs black. Length 8 mm.

Differs from the preceding in the smaller size, more shining surface, differently coloured elytra and the absence of patches of silvery pubescence on the abdomen. Head very similar to that of *borneensis*, but the posterior angles less acute, more broadly rounded, the sculpture finer and with a few silvery hairs. Antennae short, the penultimate joint more than twice as broad as long. Thorax slightly transverse, the sides parallel for the first half, then rounded and retracted to the base, along the whole of the middle with an elevated, rather broad shining line, the sculpture much less coarse than in *borneensis* and consisting of more or less confluent umbilicate punctures, without marked rugae and with a sparing black and white pubescence. Elytra (measured from the base) a little longer than the thorax, closely, roughly punctured, with scattered black and white pubescence all over on the disc mixed with orange yellow hairs. Abdomen moderately finely and moderately closely punctured, rather sparingly covered with black and white hairs without definite patches of thicker pubescence.

♂ : 6th ventral segment with a shallow arcuate excision.

North Borneo; Bettotan, August 22nd. Unique. In my collection.

### TACHYPORINAE.

**Conosoma ceylanense** Kr.

Bettotan, August 11th.

**Coproporus heterocerus** Fol.

Samawang, August 11th.

**Coproporus iridescens** Cam.

Bettotan, July 30th, August 23rd.

**Coproporus minutissimus** Bernh. var. **nigriceps** var. n.

This form only differs from the type in the head being black.

North Borneo; Samawang, July 14th. Malay Peninsula; Selangor.

*Tachinomorphus fulvipes* Er.

Bettotan, July 30th.

### ALEOCHARINAE.

*Coenonica abdominalis* sp. n.

Rather shining; head and elytra black, thorax pitchy brown, abdomen reddish scarcely infuscate before the apex. Antennae black, the 1st joint yellow. Legs yellow. Length 2.4 mm.

A small narrow species. Head narrower than the thorax, lightly impressed along the middle, rather closely covered with moderate umbilicate punctures. Antennae with the 4th to 10th joints transverse. Thorax transverse, the sides rounded and dilated in front, retracted behind, the posterior angles acute and prominent, before the base in the middle with a fovea, more finely, more closely and somewhat asperately punctured. Elytra a little longer and broader than the thorax, more closely and less finely punctured. Abdomen very finely and rather sparingly punctured. In the two examples before me I am uncertain as to the sex; in one example the 8th dorsal segment has on each side of the middle two small and closely approximated teeth and on each side at the lateral margin another larger one; in the other the 8th dorsal segment has a rather broad triangular excision in the middle of the posterior margin, from the apex of which springs a short spine (shorter than the margin of the excision), the lateral margin has a slender incurved spine on each side.

North Borneo; Samawang.

*Placusa cyanescens* sp. n.

Moderately shining, the fore-parts blue black, the abdomen pitchy. Antennae black, the first three joints yellow. Legs yellow. Length 1.5 mm.

At once recognised by the colour. Of the build of *P. pygmaea* Kr. but rather narrower, the antennae a little stouter, the puncturation of the head and thorax less close, that of the elytra rather coarser, that of the abdomen a little finer and a little less close.

♂: 8th dorsal segment in the middle of the posterior margin with a small triangular tooth, at the lateral margin with a long slender spine.

North Borneo: Samawang. Unique. In my collection.

*Zyras granulipennis* sp. n.

Shining dark reddish-brown, the abdomen with the side margins and apex lighter. Antennae reddish, the first three joints yellow. Palpi pitchy, the 4th joint yellow. Anterior legs pitchy, the middle and posterior with the base

of the femora, tibiae and tarsi pale yellow, the rest blackish. Length 6 mm. Near *Z. rugosissimus* Cam., of similar colour, but narrower, the head and thorax narrower, the former more coarsely and much more closely punctured, the antennae shorter and differently coloured, the elytra closely studded with pyramidal granules. Head narrower than the thorax, the post-ocular region obliquely retracted to the neck, in front in the middle with a raised round smooth yellowish space, along the middle with a narrow irregular smooth space, the rest of the surface very coarsely, closely and rugosely punctured. Antennae moderate, the 2nd joint a little shorter than the 3rd, 4th and 5th slightly longer than broad, 6th to 8th as long as broad, 9th and 10th transverse, 11th stout, conical. Thorax about as long as broad, the sides margined, rounded in front and retracted behind, the posterior angles obtuse, at the middle of the base with a fovea, in front of it with a smooth shining line not reaching the anterior margin, very coarsely, closely, rugosely and irregularly sculptured. Elytra scarcely as long, but broader than the thorax, not quite so shining as the rest of the insect, closely studded with large pyramidal granules. Abdomen very shining, practically impunctate and glabrous.

North Borneo; Bettotan. Unique. In my collection.

***Zyras bettotanus* sp. n.**

Shining; head, thorax and elytra black, the latter with the base rather broadly and indeterminately reddish-yellow, the sutural margin very narrowly reddish; abdomen red, the last two segments black. Antennae black, the first three joints yellowish red, the 11th reddish. Legs yellow. Length 5.5 mm. Of the build of the European *Z. fulgidus* Gr., but differently coloured and with longer antennae, rather more sparingly punctured thorax and asperate elytra. Head very sparingly, finely punctured. Antennae reaching a little beyond the base of the elytra, the 2nd joint shorter than the 3rd, the 4th to 10th transverse, the 11th conical, as long as the two preceding together. Thorax about a third broader than long, the sides rounded in front and retracted behind, setiferous, before the base with a deep round fovea, very sparingly, moderately finely punctured on the disc towards either side with a small group of closer punctures. Elytra a little longer and distinctly broader than the thorax, coarsely, rather closely, asperately punctured at the basal and sutural regions, the postero-external area more sparingly finely and simply punctured, the sides setiferous. Abdomen closely punctured at the base of the first three segments, practically impunctate elsewhere, the sides setiferous: last segment narrowed towards apex which is slightly notched in the middle (? ♀).

North Borneo; Bettotan, August 25th. Unique. Type in my collection.

## X. NEUE LYCIDEN DER MALAIISCHEN SUBREGION.

Von R. KLEINE, Stettin.

(Figs. 1—19).

Obwohl die Hauptmasse der neuen Lyciden der orientalischen Region für die Bearbeitung des Cat. of Indian Insects schon publiziert ist, hat sich doch noch Material aufgefunden, das hier nachträglich bekannt gemacht wird. Es muss darauf ankommen, den Katalog so vollständig wie möglich zu machen und es mögen daher die nachträglichen Beschreibungen entschuldigt werden.

*Ditoneces curvicollis* sp. n. (fig. 1—3).

Einfarbig schwarz, stark glänzend.—Stirn so breit wie ein Augendurchmesser, über den Fühlerbeulen stark vertieft, Mittelfurche breit und flach, Behaarung dünn. Fühler schlank, an den mittleren Gliedern die Lamellen  $2\frac{1}{2}$  mal so lang wie das Glied selbst, Unterbehaarung kurz und dicht, an den Rändern mit einzelnen längeren Haaren, Skulptur sehr grob. Prothorax Abb. 1.3 eckig, Hinterranddecken zahnartig nach hinten zurückgebogen, Mittelfurche fast durchgehend, Ränder stark aufgebogen, Punktierung in den Randvertiefungen sehr kräftig, Behaarung nur an den Rändern. Elytren mit deutlichen Rippen und vorwiegend quadratischer Gitterung, Behaarung nur am Aussenrand stark, sonst schwächer. Bei dem Weibchen sind die Fühler tief gezahnt.

Länge: 6—7 mm., Breite (hum.)  $1\frac{1}{2}$  mm. circa.

Malay Peninsula: Perak (Doherty). Typen im Brit. Mus. 3 ♂, 2 ♀.

Von dem sehr ähnlichen *assamicus* Kln., durch den gänzlich anderen Prothorax auch ohne Penisautopsie sicher zu unterscheiden.

*Ditoneces indistinctus* sp. n. (fig. 4—6).

Brust und Abdomen schwarz, Kopf, Fühler und Elytren in der hinteren Hälfte mehr oder weniger dunkelbraun, Prothorax und Schildchen zuweilen angedunkelt, Elytren erdbraun, Prothorax zuweilen auch von dieser Farbe, am ganzen Körper, namentlich aber auf den Elytren dicht behaart. Stirn des Mannes schmaler als ein Augenhalmeser des Weibes, so breit wie dieser, über den Fühlerbeulen vertieft mit schmaler Mittelfurche. Fühler des Mannes zart, Lamellen an den mittleren Gliedern  $1\frac{1}{2}$  mal so lang wie das Glied selbst, des Weibes tief gezahnt, Unterbehaarung kurz und dicht mit einzelnen langen Haaren untermischt. Prothorax Abb. 4., Mittelfurche sehr zart, Ränder mittelstark aufgebogen, Randpunktierung kräftig, auf den Elytren sind Rippen und Gitterung durch die dichte Behaarung verdeckt.

Länge:  $6\frac{1}{2}$ —7 mm., Breite (hum.)  $1\frac{1}{2}$  mm. circa.



Malay Peninsula: Perak (Doherty). Borneo; Peugarol (Doherty) 1 ♂, 2 ♀ Typen im Brit. Mus.

*Ditoneces soror* sp. n. (fig. 7—9).

Unterseite des Körpers dunkelbraun, Beine, Fühler und Schildchen schwärzlich, Kopf, Prothorax und Elytren schmutzig rotbraun, letztere nach dem Hinterrand zu dunkler werdend. Stirn so breit wie ein Augenhaltmesser, über den Fühlerbeulen auffällig stark vertieft, Fühlerbeulen sehr flach mit undeutlicher Mittelfurche. Fühler schlank, Lamellen an den mittleren Gliedern höchstens  $\frac{1}{3}$  so lang wie das Glied selbst, lang behaart. Prothorax Abb. 7., Mittelfurche breit, Ränder mittelstark aufgebogen, Ränder stark aufgebogen, Behaarung dicht. Elytren kurz und dicht behaart, Rippen und Gitterung nicht ganz verdeckend. Penis von auffallend gedrehter Form.

Länge: 6 mm., Breite (hum.) 1.25 mm. circa.

Malay Peninsula: Perak (Doherty). 1 ♂ im Brit. Mus.  
*Leptotrichalus rubrosignatus* sp. n.

Unterseite des Körpers und Kopf schwarz, Beine und Fühler dunkelbraun, die basalen Glieder etwas dunkler, Prothorax und Elytren schwärzbraun, auf letzteren sind die Rippen in der vorderen das 4. Nach vorn werden die Glieder kürzer und etwas schmaler, vom 5. ab ist deutliche Zähnung bemerkbar, Behaarung kurz und dicht. Prothorax mit durchgehender Areole, die am Vorder—und Hinterrand offen ist. Randpunktierung nur am Vorderrand deutlich. Schildchen hinten 3 eckig eingebuchtet. Elytrentgitterung keine einheitlichen Figuren bildend, 4—5 eckig und ganz formlos.

Länge: 8 mm., Breite (hum.)  $1\frac{1}{2}$  mm.

Malay Peninsula: Perak (Doherty). 2 ♂, 2 ♀ Typen im Brit. Mus.

*Dilophotes costatus* sp. n. (fig. 10—11).

Schwarz, Elytren mennigerot, Aussenränder schmal, schwarz gestreift, hinteres  $\frac{1}{4}$  geschwärzt. Kopf schmal gefurcht, Fühlerbeulen ganz flach, Fühler gedrunken, vom 3. Glied ab etwas länger als breit, alle Glieder dicht stehend, ungezähnt Abb. . . Prothorax länger als breit. Auf den Elytren ist die 1. Rippe stark verkürzt, die 2. und 3. sind auffallend erhöht, nach dem Hinterrand verflachen sich die Rippen ganz allgemein. Skulptur punktiert, durch die zarte Behaarung etwas verdeckt.

Länge: 5 mm., Breite (hum.) 1 mm. circa.

Malay Peninsula: Perak (Doherty). 1 ♀ Typus im Brit. Mus.

*Cautires selangorensis* sp. n. (fig. 12—13).

Schwarz, nur die Elytrentgitterung und die Rippen auf den Elytren fuchsrot behaart, mit Ausnahme der Elytren

glänzend. Fühler des Mannes pectinat, Lamellen etwa doppelt so lang wie das Glied selbst, sehr kurz behaart und kräftig skulptiert. Prothorax am Hinterrand so lang wie in der Mitte hoch, Vorderrand dachförmig abfallend, Vorderecken stumpf, Seiten schwach nach aussen gebogen, Hinterecken schwach spitz vorgezogen, Areolen stumpfkanstig, seitliche Areolen ganz obsolet, fast fehlend, Punktierung am Vorderrand kräftig, sonst schwach, Elytrentgitterung sehr deutlich, 4—5 eckig, Behaarung sehr kurz.

Länge: 6 mm. Breite (hum.) 2 mm. circa.

Malay Peninsula: Selangor; Kuala Lumpur 21st July, 1929. (H. M. Pendlebury).

Die Art ist *simulans* Kln., und *dissentaneus* Kln., sehr ähnlich. Von letzterer Art trennt zunächst die Grösse (8—11 mm.). Der Prothorax ist sehr viel breiter und die Areolen sind undeutlicher. Von beiden Arten trennt die Form des Penis aber ganz sicher. Am ähnlichsten ist *selangorensis* in der Penisform noch *dissentaneus*. Die Pigmentierung des Präputiums ist bei beiden Arten aber gänzlich verschieden. Der Typus (♂) ist dem Britischen Museum überwiesen worden.

#### **Xylobanellus gen. n.**

Kopf kurz, kein Rüssel. Fühler schlank, nicht oder nur schwach gezähnt, die Glieder länger als breit. Prothorax wie bei *Conderis*. Elytren wie bei *Xylobanus*.

Typus der Gattung: *X. atricolor*.

Es handelt sich hier um eine Zwischenform. Wie aus der kurzen Beschreibung hervorgeht, könnte man die Gattung ebensogut zur Verwandtschaft von *Conderis* wie von *Xylobanus* stellen. Ich bringe sie in die letztere Verwandtschaft, da das Fehlen der Sekundärrippen als ein dominantes Merkmal zu betrachten ist. Die Thoraxform kommt nicht nur bei *Conderis* vor, sondern auch in einer Anzahl anderer Gattungen.

#### **Xylobanellus atricolor sp. n.**

Einfarbig schwarz, Kopf mit breiter Mittelfurche, hochglänzend, zart skulptiert. Zweites Fühlerglied sehr klein, drittes dreieckig, länger als breit, viertes länger als das 3., conisch, die folgenden kürzer als das 4., unter sich gleich lang, nach vorn zu schmaler werdend, Behaarung sehr kurz und dicht, Prothorax breiter als hoch, discoidale Areole gross, mit dem Vorderrand und den Seitenrändern durch kräftige Rippen verbunden, Behaarung nur an den Rändern, Punktierung am Rande, sonst fast fehlend, Schildchen länger als breit, am Hinterrand gerade, kurz behaart. Elytrentgitterung quadratisch bis quer rechteckig, Behaarung auf den Rippen kräftig, am Rande dicht und borstig, am ganzen Körper mehr oder weniger glänzend.

Länge: 6 mm. Breite (hum.) 2 mm. circa.

Malay Peninsula: Selangor; Bukit Kutu 8th Sep. 1929, 3500' (H. M. Pendlebury).

Der Typus (♀) ist dem Britischen Museum überwiesen worden.

*Calochromus siamensis* sp. n. (fig. 14—16).

Unterseite des Körpers, Beine, Kopf und Fühler blauschwarz glänzend, Prothorax blauschwarz mit einzelnen kurzen roten Härchen, Schildchen von gleicher Farbe, Elytren dunkel ziegelrot, Kopf glatt, Stirn nicht vertieft, nur mit schmaler Mittelfurche. Fühler Abb. 18., ungezähnt, die Glieder nach vorn an Breite, nicht an Länge abnehmend. Behaarung sehr kurz und dicht. Prothorax Abb. 19., Mittelfurche am Vorderrand fehlend. Schildchen ohne Einbuchtung, Elytrenrippen nur schwach, aber doch erkennbar.

Länge: 8—10 mm. Breite (hum.) 2 mm. circa.

Malay Peninsula: Renong (Peninsular Siam). Typen ♂ und ♀ im Britischen Museum.

*Calochromus perakensis* sp. n. (fig. 17—18).

Blauschwarz, Elytren blutrot mit blauschwarzem schmalen Seitenrand, der sich am Hinterrand etwa im letzten Vierte über die ganze Elytre erweitert, Glanz mittelstark. Stirn ohne Mittelfurche, glatt, einzeln behaart. Letztes Glied der Mandibulartaster kurz und dick. Fühler wie bei *siamensis*. Prothorax von der gleichen Gestalt, Mittelfurche sehr schwach, überall zerstreut fuchsrot behaart. Schildchen nach hinten keilförmig verschmälert, schwach eingebuchtet, behaart, Elytren mit deutlichen Primärrippen und starker Behaarung.

Länge: 8 mm., Breite (hum.) 2½ mm.

Malay Peninsula: Perak (Doherty). Typus (♀) im Brit. Mus.

Von *siamensis*, mit der sie sicher nahe verwandt ist, durch die Ausfärbung und Form der Mandibulartaster unterschieden.

*Dilophotes grossus* sp. n. (fig. 19).

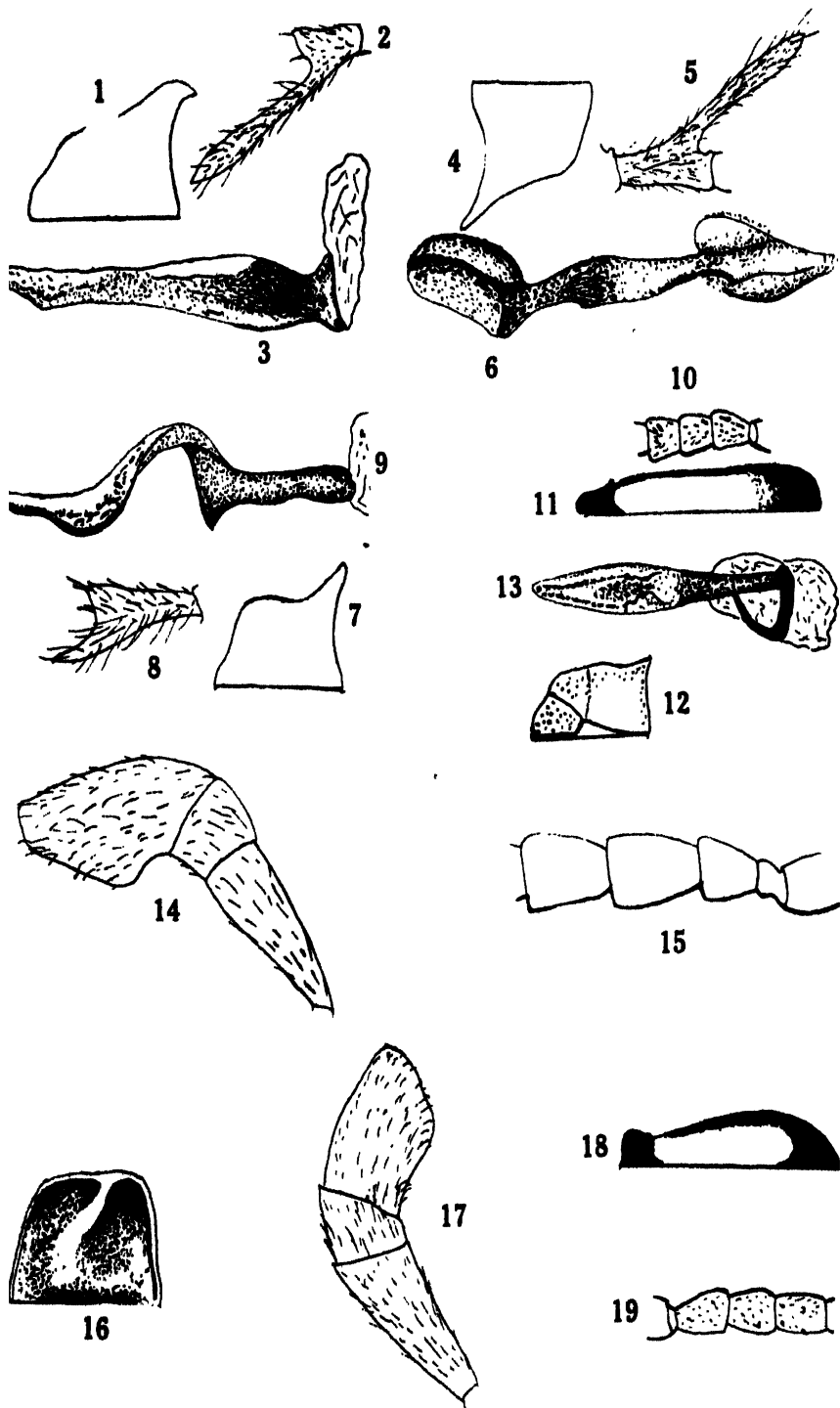
Einfarbig schwarz, Kopf schmal gefurcht, Fühler *costatus*-ähnlich, die Glieder aber durchgängig länger, nach vorn zu etwas schmaler, aber nicht kürzer werdend Abb. 32. Prothorax am Hinterrand so breit wie in der Mitte hoch, Hinterecken spitz vorgezogen, Punktierung in der Vorderrandspartie sehr stark. 1. Rippe bis über die Flügelhälfte gehend, alle Rippen gleich stark entwickelt und wenig über den Elytrengrund erhaben, Skulptur aus grober Punktierung bestehend.

Länge: 8½ mm., Breite (hum.) 2 mm. circa.

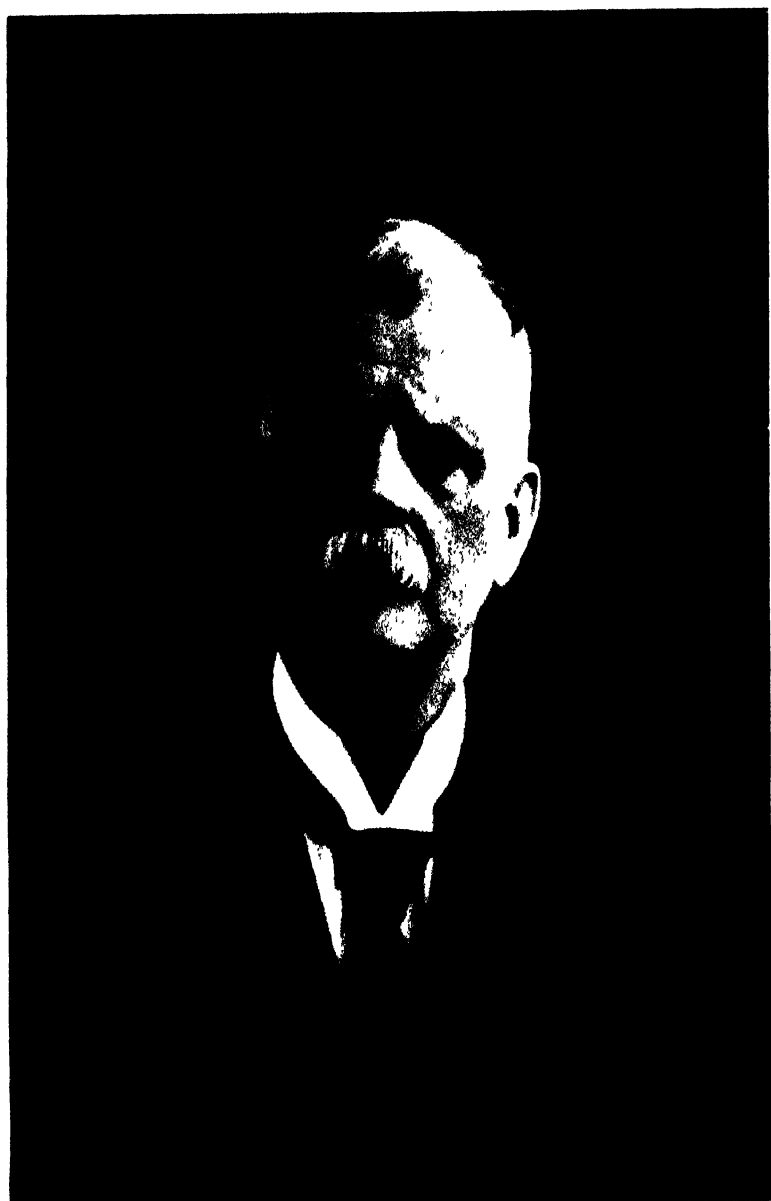
Malay Peninsula: Perak (Doherty). 1 ♀ Typus im Brit. Mus.

## FIGURENVERZEICHNIS.

Abb.	1.	Prothorax		
	2.	Mittleres Fühlerglied	♂	} von <i>Ditoneces curvicollis</i>
	3.	Penis		
	4.	Prothorax		} von <i>Ditoneces indistinctus</i>
	5.	Mittleres Fühlerglied	♂	
	6.	Penis		
	7.	Prothorax		} von <i>Ditoneces soror</i>
	8.	Mittleres Fühlerglied	♂	
	9.	Penis		
	10.	2.—5. Fühlerglied		} von <i>Dilophotes costatus</i>
	11.	Habitusbild		
	12.	Prothorax		} von <i>Cautires selangorensis</i>
	13.	Penis		
	14.	Mandibulartaster		} von <i>Calochromus siamensis</i>
	15.	1.—5. Fühlerglied		
	16.	Prothorax		
	17.	Mandibulartaster		} von <i>Calochromus perakensis</i>
	18.	Habitusbild		
	19.	1.—5. Fühlerglied		von <i>Dilophotes grossus</i>







*Herbert C. Robinson*

**Page headings pp. 177–429**

**for 1930 read 1931.**





# XI. A LIST OF THE DRAGONFLIES (ODONATA) OF THE MALAY PENINSULA WITH DESCRIPTIONS OF NEW SPECIES.

By F. F. LAIDLAW.

(Text-figures 1—7).

- i. Introduction
- ii. Systematic
- iii. List of Species
- iv. Faunistic Literature

## I. INTRODUCTION.

It is upwards of a quarter of a century ago since I was able to publish a list of Malayan Dragonflies, and as I believe that stock-taking is of some use I am glad to have been given the opportunity of making a fresh list, based on the collections of the Federated Malay States Museums and the Raffles Museum, Straits Settlements, and wish in the first place to offer my thanks to Mr. C. Boden Kloss, Director of Museums, S.S. & F.M.S., and to Mr. H. M. Pendlebury, Systematic Entomologist, F.M.S. Museums, for that opportunity.

I have tried to make my list complete, and in it have recorded every species I have been able to find that has a satisfactory claim to be included.\*

There are certainly some common species that almost beyond doubt occur in the Peninsula of whose capture I can find no record. These have been omitted from my list.

So far as possible I have given the locality and name of the captor of the specimens I have personally examined; in the case of species that I have not seen I have made reference to the authority recording them.

The first collector whose name I can find quoted as having captured dragonflies in the Peninsula is A. R. Wallace. Several of his captures are described as new species by de Selys, and they are said to be from Singapore, and in some cases from Mt. Ophir, Malacca.

No large collection was made after Wallace's time for many years. It was my good fortune to spend some time in Kelantan and North Perak in 1899-1900, and although at that time I did not specially interest myself with these insects, I was able with the help of other members of the "Skeat Expedition", to collect some seventy or so species, including several that had not previously been described. This material enabled me to give the first list of Malayan dragonflies referred to above.

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\* Since this paper was received further material from Kedah and the adjacent Langkawi Islands and from Aor Island off the east coast of Johore has been submitted to Dr. Laidlaw. It is hoped to give an account of it in a later number of this Journal. C.B.K.

At about this time several other collections were made in different parts of the Peninsula. Prof. R. Martin, the anthropologist, collected, mainly I believe in Perak. In Kelantan, Pahang, and Perak two collectors obtained specimens, though both were mostly interested in *Lepidoptera*. These were Waterstradt and Grübauer, and their collections were described in part by Förster.

Mr. H. N. Ridley also from time to time sent material to the British Museum from Singapore.

Dr. Ris also collected a few specimens in Singapore during a short stay at that port.

A considerable collection was made by Dr. W. L. Abbott also about the close of the century, in the northern part of the Peninsula. Lastly Dr. Annandale and Mr. H. C. Robinson paid some attention to these insects in Patani and Jalor, in the opening year of present century.

After this there seems to have been a long lull in the history and it was not till after the war that the late Dr. J. C. Moulton and Mr. F. N. Chasen of the Raffles Museum sent me any further material, though no doubt an occasional specimen found its way into the Museums' collections from time to time.

Lastly I have to thank Mr. Boden Kloss, Mr. Pendlebury and the other gentlemen whose captures are acknowledged in the sequel for the extensive collection before me on the strength of which I have drawn up this second list.

The list is a little shorter than that given for Borneo (*postea*) and shows that the Peninsula has a fairly well marked individuality. About 13.5% of the species are precinctive so far as our knowledge goes. Both Sumatra and Borneo show somewhat higher percentages, that of Java is likewise comparable though a little smaller.

Perhaps the most striking instance of individuality of the Odonate fauna of these areas is to be found in the occurrence of a species of *Vestalis*, (*V. luctuosa*), in Java, allied to a Philippine species, whilst Sumatra has a second closely allied species belonging to the same group; and none of this small group occur in Borneo or in the Peninsula.

Some general observations on the distribution of the Malayan fauna will not be out of place here. Lest I should expand this paper to unreasonable length I state my views somewhat dogmatically. To discuss them at length would tax the patience of readers unnecessarily. I have, however, arguments to support my statements. I purposely use the term "group" in a somewhat indefinite sense. It may be taken as meaning a genus, or group of genera, which stands as a readily recognizable phylogenetic entity. A group of higher rank may of course be a subfamily or even a family in the accepted use of the term.

There are then in the Peninsula representatives of certain groups which have the distribution noted below.

- I. Holotropical.  
*Gynacantha.* *Brachydiplacini.*  
*Protoneurinae.*
- II. Palaeotropical.  
*Libellagidae.* *Synlestinae.*  
*Pseudagrion.*  
*Tetrathemini.*  
*Rhyothemis.*
- III. Oriental & Papuan.  
*Teinobasis.* *Neurothemis.*  
*Hemicordulia.*  
 (these two groups reach the Seychelles Is.).  
*Lyriothemis* (and its immediate allies).
- VI. Oriental & Ethiopian.  
*Heliaeschna.*  
*Ceriagrion.*
- V. Oriental, Papuan and Neotropical.  
*Platystictidae.*

Speaking roughly all these groups show little or no sign of having their distribution influenced by the geographic boundary known as "Wallace's Line".

Their distribution is only to be explained on the assumption that they are survivals of a time when there existed far greater facilities for the spreading of a land fauna over the different tropical land-masses than exist at the present time. Whether it be necessary to go back to a date as remote as that assigned to Gondwanaland or no I am not competent to say.

One or two other groups probably belong to this category: I have not been able to satisfy myself that they are properly assigned here. They are the following:—

- Coeliccia.*  
*Agriocnemis.* *Leptogomphus.*  
*Megapodagruidae.*

There is a second category of groups which evidently have a different history.

These groups in the main are limited in their distribution, so far as the Oriental Region is concerned by "Wallace's Line". They may be regarded as members of a fauna which has succeeded in invading the region from the north. This invasion was not a single stream but has been derived from different sources at different dates. The most interesting groups of this category are:—

- Agridae.*  
*Epallagidae.* *Sieboldius*  
*Chlorogomphinae.* *Caliaeschna.*  
*Onychogomphus* (and immediate allies).

Genera not listed here must be regarded for the present as being *incertae sedis*.

Some of the few groups however that are entirely confined to the Region may be taken as belonging to the fauna included among the genera of the first category. Such are

*Macrogomphus* (and immediate allies).

*Idionyx*.

*Tetracanthagyna*.

There is every reason to believe that the spread of species is going on at the present time. This spread seems to be mostly of the nature of a gradual infiltration, and there is more evidence of a movement from the north southward than in the opposite direction. Quite a number of species, or even of genera, find their most southerly limit in the Peninsula, or barely pass it into one or more of the great islands which lie near.

Examples which may be quoted are such as *Calicnemis*, *Pseudothemis*, *Brachythemis contaminata*, *Trithemis pallidinervis*, *Rhinocypha fenestrella*, &c. &c.

In the following list the initials H.M.P. stand for Mr. H. M. Pendlebury. Other collector's names are given in full.

I have attempted to note all records for Singapore as it occurs to me that such records may be of particular interest in view of the many changes which have been in progress in the Island in the last hundred years or so.

[Authors' names are bracketed in accordance with Art. 23 of the International Rules for Zoological Nomenclature, 1904.]

\*Species not in the S.S. and F.M.S. Museums collections are marked with an asterisk.

## II. SYSTEMATIC.

- No. 22. *Drepanosticta pan* sp. n.
- 23. " *hamadryas* sp. n.
- 39. *Coeliccia nigrescens* sp. n.
- 47. *Ceriagrion pendleburyi* sp. n.
- 68. *Gynacantha risi* sp. n.
- 80. *Merogomphus femoralis* sp. n.
- 81. *Burmagomphus seimundi* sp. n.
- 85. *Acrogomphus minor* sp. n.

## III. LIST OF SPECIES.

Sub-order ZYGOPTERA.

AGRIIDAE=CALOPTERYGIDAE Selys pars.

### 1. *Neurobasis chinensis* (Linn.)

- 1 ♂. Pahang: Kuala Tahan, 300', Nov. 1921, H.M.P.
- 1 ♂. Perak: Batang Padang; Jor Camp, 1000', Feb. 1924, H.M.P.
- 1 ♀. Kedah: Gurun, Dec. 1915.
- 1 ♂, 2 ♀ ♀. Pahang: Kuala Tahan, 350', Feb. 1921, E. Seimund.

Ranges over most of the Oriental Region. Represented by local races, or closely allied species in the Philippine Is., Celebes and New Guinea.

Found only in the vicinity of running water. This is the only member of its family which passes "Wallace's Line," and it has probably invaded its more easterly territories at a comparatively recent date.

## 2. *Climacobasis modesta* (Laidlaw).

*Echo modesta* (♀), Laidlaw, Proc. Zool. Soc. London, I, 1902, p. 84, Pl. V, fig. 6.

*Climacobasis lugens* (♂), Laidlaw, loc. cit., p. 85, Pl. VI, fig. 5.

3 ♂♂. Perak: Batang Batang Padang, Jor Camp, 1800', June 1923, H.M.P.

4 ♂♂, 3 ♀♀. Pahang: Lubok Tamang, 3500', June 1923, March 1924, H.M.P.

1 ♂. Pahang: E. Seimund.

1 ♀. Selangor: Gombak Valley 21st. mile Oct. 1921, H.M.P.

This monotypic genus, closely allied to *Echo*, is apparently confined to the hill country of the Peninsula. I have records of its occurrence in Kelantan (Laidlaw) and from Bukit Besar in Nawng Chik in Peninsular Siam, where it was taken by Dr. Annandale. It is the only Odonate genus whose range is entirely confined to the Peninsula.

The specific name *lugens* given in the first instance to the male, had reference to the white pruinescent patch on the head of the adult of that sex, white being of course the mourning colour of the Chinese.

When I first described this form I regarded the female as a distinct species from the male. As the two are unquestionably conspecific the specific name of the female, which was described on an earlier page than the male, must take precedence.

## 3. *Vestalis amoena* Selys.

2 ♂♂, 3 ♀♀. Singapore Is.: Bukit Timah, May-Aug. 1923, H. C. Abraham.

1 ♀. Singapore Is.: Ulu Pandan.

2 ♂♂, 1 ♀. Perak: Batang Padang, Jor Camp, 1800', June 1923, F. N. Chasen.

1 ♂. Perak: Taiping. Dec. 1923, M. R. Henderson.

2 ♂♂, 1 ♀. Pahang: Kuala Tahan, Feb. 1921, E. Seimund.

1 ♂. Selangor: Kuala Lumpur, April 1923, H.M.P.

Generally flies in forest country and may be found some distance from running water.

## EPALLAGIDAE.

4. *Euphaea ochracea ochracea* (Selys).

- 2 ♂ ♂, 2 ♀ ♀. Peninsular Siam; Nakon Sri Tamarat, Khao Ram, 600'-1200', Feb.-March 1922, H.M.P.  
 1 ♂. Pahang; Kuala Tahan, 350', Nov. 1921, H.M.P.  
 1 ♀. Pahang; Sungei Tahan, 350', Feb. 1921, E. Seimund.  
 1 ♂. Perak; Batang Padang, Jor Camp, 1800', June 1923, H.M.P.  
 1 ♀. Selangor; Gombak Valley, 21st. mile, Oct. 1921, H.M.P.

The Burmese race (*brunnea* Sleys) is distinguishable by its rather larger size, rather richer colouring of the wings, and by the fact that in it the brown colouring of the hind wing fades to a very pale yellow before the level of the pterostigma, whilst in *ochracea* race the whole of the hindwing is evenly tinged with brownish-yellow to the apex.

*ochracea* ♂ length of hind-wing 28.5 mm.

*brunnea* ♂ length of hind-wing 31 mm.

I have been able to examine and compare a series of the males of both races and believe the differences to be quite constant. At the same time I regard *brunnea* as a geographical race of *ochracea*.

5. \**Euphaea impar impar* (Selys).

*Euphaea impar*, Laidlaw, Proc. Zool. Soc. London, I, 1902, p. 87.

Taken by me on the Aring River, Kelantan. The species is recorded also from Sumatra, by Kruger.

6. \**Euphaea masoni* (Selys).

*Euphaea masoni*, Laidlaw, Fasc. Malay., Zoology, Pt. I, 1903, p. 194.

Taken by Dr. Annandale at Mabek in Jalor. The species probably has local races in Lower Burma, Siam, and Tonkin but these have not as yet been discriminated.

7. *Dysphaea dimidiata* Selys.

*Dysphaea limbata*, Laidlaw, Proc. Zool. Soc. London, I, 1902, p. 88.

- 4 ♂ ♂, 3 ♀ ♀. Pahang; Kuala Tahan, 300-500' Feb. 1921, E. Seimund.  
 2 ♂ ♂. Pahang; Kuala Tahan, 300', Nov. 1921, H.M.P.

I believe *limbata* is a variety only of *dimidiata*.

\*Species not in the S.S. and F.M.S. Museums collections are marked with an asterisk.

# LIBELLAGIDAE.

## 8. \**Rhinocypha karschi* Krüger.

*Rhinocypha karschi*, Krüger, Stettin Entomol. Zeit., 1898, p. 33.

Laidlaw, Proc. Zool. Soc. London, I, 1902, p. 90.

I took three males of this species on the Aring River at Kuala Aring in Kelantan in August 1899.

It is recorded also from Sumatra, and Borneo. The only species of the genus ranging over these three areas.

## 9. *Rhinocypha biforata* Selys.

*Rhinocypha biforata*, Williamson, Proc. U.S. Nat. Mus. xxviii, 1904, p. 179, fig. 12.

1 ♂. Malay Peninsula. (no other data).

Occurs also in Siam and in Burma.

## 10. *Rhinocypha perforata limbata* Selys.

*Rhinocypha perforata* var. *limbata*, Selys, Bull. Acad. Belg. (2) XLVII, p. 302, (1879).

Ris, Supplementa Entomol. No. V. 1916, Taf. 1 fig. I.

*Rhinocypha inas*, Laidlaw, Proc. Zool. Soc. London, I, 1902, p. 88, Pl. VI. fig. 6.

*Rhinocypha apicalis*, Laidlaw, Fasc. Malay. Zool. I, p. 196. 1903. (?nec. Krüger).

1 ♂. Peninsular Siam; Nakon Sri Tamarat, Khao Luang, March 1922, H.M.P.

1 ♂. Pahang; Sungei Tahan, Feb. 1921, E. Seimund.

1 ♀. Pahang; Kuala Tahan, Feb. 1921, E. Seimund.

1 ♂. Same locality 350', Nov. 1921, H.M.P.

2 ♂ ♂, 2 ♀ ♀. Pahang; Kuala Teku, 550', Feb. 1921, E. Seimund. Dec. 1921, F. N. Chasen.

The subspecies ranges to Burma, whilst the typical race *perforata* Percheron, occurs in Tonkin, Cambodia and Formosa.

Krüger's species *apicalis* described from an immature male requires reidentification. In all probability it is not synonymous with the present species, but may be an immature *biforata*.

## 11. *Rhinocypha fenestrella* Rambur.

*Rhinocypha fenestrella*, Williamson, Proc. U.S. Nat. Mus. XXVII, pp. 178-179, figs. 9-10-11, 1904.

Fraser, Journ. Bombay Nat. Hist. Soc. XXXII, No. I, pp. 193-194, Pl. III, fig. 2, (1927).



- 2 ♂♂, 2 ♀♀. Peninsular Siam; Nakon Sri Tamarat, Khao Luang, 2000', March 1922, H.M.P.
- 2 ♀♀. Pahang; Gunong Tahan, Padang, 5500', Dec. 1922, H.M.P.
- 1 ♂, 1 ♀. Pahang; Kuala Teku, 550', Dec. 1921, F. N. Chasen.
- 1 ♂. Pahang; Kuala Tahan, 350', Nov. 1922, H.M.P.
- 2 ♂♂, 2 ♀♀. Perak; Batang Padang, Jor Camp, 1500'–3500', May–June 1923, F. N. Chasen, H.M.P.
- 6 ♂♂. Pahang; "Cameron's Highlands", Tanah Rata and Rhododendron Hill, 4800'–5200', June 1923, H.M.P.
- 2 ♂♂, 1 ♀. (immature). Same locality, October 1923, H.M.P.
- 2 ♀♀. (immature). Same locality, January 1924, H.M.P.
- 1 ♂, 1 ♀. Pahang; Lubok Tamang, 3500', March 1924, June 1923, H.M.P.
- 1 ♂. Selangor; Gombak Valley, October 1921, H.M.P.

Fraser has recently recorded this fine species from Sitang (?Sintang) Borneo. (*loc. cit. supra*). Its previously known range extended from Burma through the Malay Peninsula, where it reaches a greater elevation than is recorded for other Malayan species of the genus.

## 12. *Micromerus lineatus* Burm.

*Micromerus lineatus*, Williamson, Proc. U.S. Nat. Mus. XXVIII, pp. 171–172, fig. 6a-b.

- 2 ♂♂. Peninsular Siam: Nakon Sri Tamarat. Klawng Tadi, Feb. 1922, H.M.P.
- 4 ♂♂. Selangor: Dusun Tua, August 1926, H.M.P.
- 1 ♂, 1 ♀. Selangor: Kuala Lumpur, March 1926, H.M.P.

Identical with specimens figured by Williamson, from Burma.

## 13. \**Micromerus aurantiacus* Selys.

*Micromerus aurantiacus*, Williamson, Proc. U.S. Nat. Mus. p. 172, fig. 7a-b.

*M. annandalei*, Laidlaw, Fasc. Malay. Zool. I, p. 197–198, (1903).

My species is certainly synonymous with that of de Selys.

## 14. \**Micromerus hyalinus* Selys.

*Micromerus hyalinus*, Kirby, Cat. Odonata, p. 115.

I have not seen specimens from the Peninsula. Recorded by de Selys. Taken by A. R. Wallace on Mt. Ophir.

15. \**Micromerus stigmatizans* Selys.

*Micromerus stigmatizans*, Kirby, Cat. Odonata, p. 115.

I have not seen example of this or of the preceeding species from the Peninsula, though Mr. A. R. Wallace took them both on Mt. Ophir. Both occur also in Borneo, and *hyalinus* has been recorded by Ris from Sumatra.

Mr. M. A. Lieftinck of Amsterdam has written to me lately that he has received examples from the Peninsula.

16. *Micromerus semiopacus* Selys.

*Micromerus semiopacus*, Förster, in Fasc. Malay. Zool. Pt. 1, 1903, pp. 198, 199. Ris, Ann. Soc. Entomol. Belg. LV, 1911, pp. 233-234, fig. 1.

*M. affinis*, Laidlaw, Proc. Zool. Soc. London, 1902, I, p. 90. Pl. VI, fig. 7.

*M. martiniae*, Karsch, Entom. Nachr. 17, p. 243, (1891).

1 ♂. Pahang: Kuala Tahan, 350', Feb. 1921, E. Seinund.

2 ♂ ♂. Pahang: Sungei Tahan, Nov. 1922, H.M.P.

The species occurs also in Borneo and Sumatra; it was taken by me on the Aring River, Kelantan, Sept. 1899.

## AMPHIPTERYGIDAE.

17. *Devadatta argyroides* (Selys).

(See Ris, Zool. Mededeel. 'S Rijks Mus. Nat. Hist. Leiden. Deel X, Aflevering I pp. 3-4, fig. 1.).

1 ♂. Kedah: Kedah Peak. 3200', Dec. 1915.

1 ♂. Penang: May 1927.

2 ♂ ♂. Pahang: "Cameron's Highlands", 4800'.

1 ♀. Pahang: Kuala Tahan, 350', Nov. 1921, H.M.P.

3 ♀ ♀. Pahang: Lubok Tamang, 3500', June 1923, H.M.P.

3 ♂ ♂, 1 ♀. Perak: Batang Padang, Jor Camp, 1800', June 1923, F. N. Chasen.

2 ♂ ♂. Selangor: Gombak Valley, Oct. 1921, H.M.P.

1 ♀. Selangor: Bukit Kutu, 3000', April 1926, H.M.P.

## MEGAPODAGRIIDAE.

18. *Rhinagrion mima* (Karsch).

*Amphilestes mima*, Krüger, Stettin Entomol. Zeit 1898, pp. 100-101.

Laidlaw, Proc. Zool. Soc. London, 1902, II, pp. 382-383.

*Rhinagrion mima*, Laidlaw, Journ. Malay. Br. R. As. Soc. Vol. II, (1924), pp. 502.

1 ♂. Pahang: Kuala Tahan, Feb. 1921, E. Seimund.

My specimens were taken at Kuala Aring, Kelantan, over a small stream in thick forest. With them were flying examples of *Rhinocypha karschi*.

19. *Podolestes orientalis* Selys.

*Podolestes orientalis*, Ris Zool. Mededeel. 'S Rijks Mus. Nat. Hist. Leiden. Deel. X, Af. I, pp. 15-16, fig. 7, (1927).

1 ♀. (fragmentary). Pahang: Kuala Tahan, Nov. 1921, H.M.P.

## LESTIDAE.

## Synlestinae.

20. *Orolestes wallacei* (Kirby).

*Lestes ridleyi*, Laidlaw, Proc. Zool. Soc. London, 1902, I, p. 92.

*Orolestes wallacci*, Ris. Zool. Mededeel. 'S Rijks Mus. Nat. Hist. Leiden, Deel X, Af. I, p. 13.

Laidlaw, Proc. Zool. Soc. London, 1928, pp. 134-135.

1 ♀. Pahang: Kuala Tahan, 300', March 1921, H.M.P.

This specimen shows faintly the same tinge of colouring between the costa and radius on all the wings as is seen in the male from Borneo figured by me (Rec. Ind. Mus. XIX, Pt. IV, Text-fig. 1, 1920). It also shows the same remarkable armature of the valvulae vulvae as is shown by Ris (*loc. cit. supra*) for *O. udeana* from Sumatra.

## Lestinae.

21. \* *Lestes praemorsa* Hagen.

*Lestes praemorsa*, Laidlaw, Proc. Zool. Soc. London, 1902, II, p. 382.

Taken in August 1899, at Kuala Aring, Kelantan. The species seems to be local in its habits, and probably has a short season in the adult state in the Peninsula. It has wide range in Tropical Asia.

It is worth remark that this genus is poorly represented in the equatorial forests of Malaysia, whilst in India it is rich in species.

## PLATYSTICTIDAE.

### Genus *Drepanosticta*.

The genus contains a large, probably a very large number of species, which by reason of their small size, cryptic colouring and retiring habits readily escape the notice of the collector and are accordingly poorly represented even in big collections.

The collection of the Federated Malay States Museums includes three male specimens of the genus, each belonging to a distinct species, two of which are new. These I name and describe below and with them I also describe a species hitherto unnamed, taken many years ago by Dr. N. Annandale on Bukit Besar in Jalor, which from an imperfect acquaintance with the genus I referred to the Selysian species *quadrata*.

Three of these species are remarkable for the presence on the superior anal appendages of a curious process, which is perhaps best characterized as brush-like, projecting downwards from about the middle of the appendage, different in shape in each species and quite unlike anything found in any other Odonate that I know of. The lower appendages of these same species show too a degree of complexity scarcely exceeded in the whole order.

The brush referred to above was entirely overlooked by me when I figured the appendages of the species here named *pan* (Journ. Malayan Branch R. As. Soc. II, 1924, Pl. V, fig. 8). It is easily missed because of its small size, and because it is semitransparent, and liable to be taken for a foreign body.

The family stands far apart from other *Zygoptera* and is of great interest.

#### 22. *Drepanosticta pan* sp. n. (fig. I.).

1 ♀. Perak: Batang Padang, Jor Camp, 1800', June 1923, H.M.P.

1 ♂. 2 ♀ ♀. Same locality F. N. Chasen.

Length of abdomen: 33 mm., of hind-wing: 22.5 mm.

Postnodals on fore-wing 13. Anal veins Y-shaped, the stem of the Y very short. (The first specimen mentioned has no vein descending from the quadrangle on either of the fore-wings). Pterostigma rather long, covering more than one cell, its inner margin more oblique than its outer; black with a fine margin of brown. *M*3 and *Rs* distal to subnodus.

**Head:** glossy black, upper lip and anteclypeus white, the lip with its anterior margin black.

**Prothorax:** yellowish-white on the dorsum, becoming blue laterally. Sides black, ventral surfaces white.

**Synthorax:** dorsum entirely metallic black. Sides greenish-white, with a broad black band along the second lateral suture. Ventral surfaces whitish.

**Legs:** pale brown, with the articulations and ciliae dark brown, and a dark brown line on the posterior surface of the femore.

**Abdomen:** slender, segment eight half as long as seven. Segments one to seven brown, darker in the middle of each segment, and with a narrow apical ring of black on each. Segment two is largely black dorsally. Segments eight, nine, and ten are black, eight dark brown basally.

**Anal appendages:** upper pair black for the basal half, the distal half brown. Each of this pair can be best described by comparing them, when seen in profile, to the head and neck of a goat without horns. The basal half represents the neck, the distal part the head. A small backwardly-directed spine would stand for the ear, and a very



Fig. 1. *Drepanos-ticta pan* sp. n. anal appendages ♂.

remarkable ventral process, which is whitish and rather brush-like, may be likened to the goat's beard. The lower pair are brown, darker at the base. Each is irregularly club-shaped, with a dorsal tooth-like projection, and each carries at its apex a curious terminal hook curved at first downwards, and then turning directly upwards terminating in a rounded knob. This hook is very like the ordinary coat-hook of the ward-robe, in miniature.

The length of the lower pair is about equal to that of the upper pair.

♀ (there are as noted above three females all taken at Batang Padang in May—June 1923 at 1800' above sea-level. They appear conspecific and are probably all to be referred to *pan*. In all of them however the anal veins do not meet to form a V or Y).

Length of hind-wing: 25 mm., of abdomen: 37 mm.

**Head:** as in the male.

**Prothorax:** pale yellow, the posterior lobe black. The lobe is produced on either side to form a minute laterally projecting horn.

**Synthorax:** as in male.

**Abdomen:** generally dark brown, each of the segments two to seven has a pale basal ring and a black apical ring. Segment eight is very short, about equal in length to nine. The sides of seven to nine are discoloured, it is possible that they are marked with blue during life though as the same segments in the males are apparently black this is unlikely.

**23. *Drepanosticta hamadryas* sp. n. (fig. 2.).**

1 ♂. Pahang: Kuala Tahan, 500', Nov. 1921, H.M.P.

Length of abdomen: 37 mm., of hind-wing: 24.5 mm. Post-nodals on fore-wing, thirteen. Anal veins Y-shaped. Pterostigma rhomboidal, its inner margin more oblique than its outer, covering one cell, dark-brown, with a very fine lighter margin. *M*3 and *Rs* distal to subnodus.

**Head:** glossy black, the upper lip and anteclypeus whitish-blue, the lip margined anteriorly with black.

**Prothorax:** dorsally dark brown, with a transverse line of black on the hinder lobe; black on the sides, whitish-yellow below.

**Synthorax:** entirely black on the dorsum, with a metallic reflex. Sides greenish-white, with a broad black band along the second lateral suture. Ventrally whitish.

**Abdomen:** very slender, segment eight half the length of seven. Segments one to seven brown, darker in the middle of each segment. The first and second segments are almost black dorsally, and each of the remaining segments three to seven has an apical ring of black. Segments eight, nine and ten are black, nine is pale blue dorsally.

**Anal appendages:** similar to those of *pan* described above: the upper pair are slenderer than in that species, and the beard-like process is relatively longer and more distinctly stalked. The lower pair are also similar to those of *pan*, but slenderer, the apical hook is more sharply bent upwards and



Fig. 2. *Drepanosticta hamadryas* sp. n. anal appendages ♂.

has no terminal knob. (The legs, except for one of the anterior pair, are missing).

**24. \* *Drepanosticta* sp.**

*Drepanosticta quadrata*, Laidlaw, (nec Selys), Fasc. Malay. Zool. Pt. IV, 1907, Odonata Pt. II, p. 9 fig. 1. (sep.)

2 ♂ ♂ 2 ♀ ♀, taken by Dr. Annandale on Bukit Besar in Jalor, 2500', April 1902.

I do not care to name this species as my material (one fragmentary male) is insufficient, and the short description given in the *Fasciculi Malayenses* is too incomplete. I am sure however that it is distinct from *quadrata*.

♂ Length of abdomen (about) 30 mm. of hind-wing 20 mm. Thirteen post-nodal cross-nerves on fore-wing. Anal veins Y-shaped with a short stalk to the Y. Pterostigma dark brown, with a fine pale border, covering a little more than one cell. *M*<sub>3</sub> and *R*<sub>s</sub> both distal to subnodus.

*Head*: Upper lip and anteclypeus greenish-blue, the former with black anterior margin. Upper surfaces otherwise black.

*Prothorax*: dorsum yellow (? blue in life) with an obscure median black mark, most intense on the middle of the hinder margin, sides black.

*Synthorax*: black on dorsum, sides pale green, with a broad black band along the second lateral suture.

*Legs*: greenish-white, with black articulations and a black band along the posterior surfaces of the femora.

*Abdomen*: slender, segments one to seven dark brown, black apically greenish-white below. Segment two has a fine, basal, greenish mark on the dorsum, triangular in shape with its apex directed backward. Trace of a similar but smaller mark on three. Three to seven have sublateral pale lunules basally. They are very small and obscure in the specimen before me. Eight, nine and ten black with turquoise blue on the dorsum of eight to nine and perhaps of ten.

*Anal appendages*: upper pair rather similar to those of *hamadryas*, but more hooked downwards apically, and with smaller spine on the dorsum. There is a distinct beard-like brush ventrally, lower pair about three-fourths length of upper pair. Each carries at the commencement of the terminal third of their length a strong, inwardly-directed spur.

♀ Coloured as the male, but segments eight, nine and ten of abdomen black, with lateral blue spots on eight to nine.

## 25. *Platysticta quadrata* Selys.

(?) *Platysticta quadrata*, Selys, Ann. Mus. Civ. Genova, (2), vol. X (XXX), 1891, pp. 75-76.

The type male was collected by Wallace in Singapore. The Selysian description gives the length of the male abdomen as 33 mm. and hind-wing 21 mm., distinctly less than the same measurements for the specimens I have recorded as *sharpi* (*infra*). Careful reconsideration of the matter,

with the opportunity of reexamining a fairly well preserved example of the male of my species leads me to suspect that the two are identical.

I think that the female (described from Burma) is probably not conspecific.

Förster (Fasc. Malay. loc. cit. supra.) notes a large male from Kelantan collected by Waterstradt, without comment. Its measurements (abd. 40 mm. hind-wing 29 mm.) indicate that it belongs to an undescribed species.

25bis. *Drepanosticta sharpi* Laidlaw. (?=*quadrata* Selys).

*Platysticta sharpi*, Laidlaw, Fasc. Malay. Zool. Pt. IV, 1907, pp. 10-11, (sep).

*Drepanosticta sharpi*, Laidlaw, Journ. Malay. Br. R. As. Soc. II, 1924, pp. 304-305, Pl. V, fig. 7.

1 ♂. Pahang: Kuala Tahan, March, 1921, E. Seimund.

Length of abdomen 40 mm., of hind-wing 22.5 mm.

Thirteen postnodals on fore-wing. Anal veins not meeting that rising from the lower margin of the quadrangle, strongly inclined inwards, absent on the left lower wing. Pterostigma pentagonal, the outer margin broken at its middle, followed by two rows of cells for a length of two or three cells; brown in colour, with a well-marked pale border. *M*<sub>3</sub> rises distal to subnodus, *R*<sub>s</sub> still more so.

*Head*: rather damaged, glossy black, upper lip and anteclypeus whitish-blue.

*Prothorax*: anterior and middle lobes light brown, as are the sides. Posterior lobe black. Ventral surfaces whitish-brown.

*Synthorax*: dorsum metallic black with a coppery-green reflex; sides and ventral surfaces whitish-yellow, with a black line, incomplete below, on the second lateral suture.

*Legs*: yellowish-white, with brown rings on the femora, and with brown tarsi articulations, and ciliae.

*Abdomen*: very slender, segment eight about one third the length of seven. Segments one to seven brown with basal pale rings and apical dark rings, the latter on seven occupying the distal half of the segment. Eight, nine and ten black, distal half of the dorsum of eight and the whole dorsum of nine light (?blue).

*Anal appendages*: upper pair black, passing to brown distally slender with a strong dorsal tooth at about the middle of their length, without any brush-like structure. Lower pair black basally, the distal part which corresponds to the distal hook of *pan* brown. The whole appendage slender, the terminal half gently curved upwards.



26. \* *Protosticta foersteri* Laidlaw.

*Protosticta foersteri*, Laidlaw, Proc. Zool. Soc. London, 1902, pp. 383-384.

Förster, Fasc. Malay. Zool. Pt. IV, 1907, Odonata, Pt. II, p. 8. (sep.)

The female from Gunong Inas, Perak, is the type of the species and was taken by myself in Jan. 1900. The male described by Förster was taken at Jor. The accounts of the two specimens tally very well and it is quite likely that they are really conspecific.

The length of the hind-wing in both sexes is 17.5 mm. The male abdomen is 38 mm. long. A similar disproportionately long abdomen is found in the males of some of the South Indian species of the genus.

The anal appendages of the male are remarkable. The upper, seen in profile are strongly bent at a right angle at their middle; the lower pair are slightly longer, very slender, incurved at the middle, and each carries at its apex a fine bundle of yellowish bristle-like hairs. These recall the bristles found on the upper appendages of such a species as *Drepanosticta pan*, though in the latter, of course, they are found on the upper appendages only. These bristle-like structures seem to be a speciality of the *Platystictidae* of the Peninsula.

## COENAGRIIDAE.

i. *Protoneurinae*.

Two genera of this series are found within our limits. As some difficulties exist with regard to the generic position of some of the species I give below a brief definition of these genera.

i. *Disparoneura*.

*Ac* lies between the level of the first and second antenodal cross-nerves. The space below the quadrangle completely divided into two superimposed cells by the rudimentary vein *Cu*<sub>2</sub>.

ii. *Caconeura*.

*Ac* as in *Disparoneura*. *Cu*<sub>2</sub> vestigial or altogether absent.

26. *Disparoneura analis* Selys.

1 ♂. Pahang: Sungei Tahan, 350', Feb. 1921, E. Seimund.

27. *Caconeura humeralis* (Selys).

*Disparoneura humeralis*, Kirby, Cat. Odonata, p. 134.

1 ♂. Pahang: Sungei Tahan, 24.11.22. H.M.P.

1 ♂, 1 ♀. Pahang: Kuala Tahan, 18-25.11.21. F. N. Chasen.

2 ♂ ♂. Selangor: Kuala Lumpur, 7.22. H.M.P.

2 ♂ ♂. Peninsular Siam: Nakon Sri Tamarat, Tai Sai river near Khao Ram, Feb.-March 1922, H.M.P.

[I think Förster's subspecies or var. *nigra* is only a colour phase due to age or possibly to decomposition of the specimen. (See Förster in Fasc. Malay. Odonata, Part II, p. 15 sep.)]

A very beautiful species, quite different from *verticalis* of which species Förster regarded it as a subspecies.

It is the only Malayan species of the genus which has carmine-red markings. The male has the vertex of the head entirely black in the adult, whilst *verticalis* (from Borneo) has a red band across the vertex just behind the ocelli.

*C. humeralis* has a well-marked vestige of the nerve *Cu 2*.

(One other red-marked species may prove to inhabit the Peninsula. This is *dorsalis* Selys. It is distinguished by having very large brick-red marks on the dorsum of the synthorax, and by the presence of a red mark on the vertex. The red humeral band of *humeralis* is very narrow).

## 28. *Caconeura notostigma* (Selys).

See Förster in Fasc. Malay. Zool., Pt. IV, 1907, Odonata, Pt. II. pp. 11-12, (sep).

1 ♂. Pahang: Kuala Tahan, 300', Nov. 1921.

1 ♀. Selangor: Bukit Cherakah Forest Reserve, 150', H. C. Abraham.

Easily distinguished by the big blue triangular marks on the synthorax of the male, and by the large pterostigma.

There is a well marked vestige of *Cu2* present.

The abdomen is entirely black save for a narrow blue mark on the dorsum of the second segment. The anal appendages are likewise black. The hinder-surfaces of the tibiae are bluish, or in the female brownish-blue.

## 29. \* *Caconeura interrupta* (Selys).

Recorded as having been taken in Singapore by Wallace. I have not seen specimens.

The species is characterized by blue markings on the vertex, on the sides of the prothorax, and by the blue bands of the synthorax which are suddenly truncated half-way up the length of the dorsum. The apex of the ninth segment

of the abdomen and the whole of the tenth segment are blue, as are the upper pair of appendages. The vestige of *Cu2* is small or rudimentary.

30. \* *Caconeura collaris* (Selys).

Recorded by De Selys from Malacca and Borneo. I have not seen specimens from either of these habitats, but have been able to examine a number of examples of what I believe to be a race of the species from the Mentawi Islands (named *dohrni* by Krüger).

In the Peninsular form there is said to be a vestige of *Cu2*, this however is apparently always absent in *dohrni*.

The male is characterized by having the posterior lobe of the prothorax largely blue, as well as having lateral blue markings. The blue stripes of the synthorax are wide anteriorly, but narrow abruptly at the middle and do not quite reach the top of the dorsum. The upper pair of anal appendages are also blue.

31. *Caconeura laidlawi* (Förster).

*Disparoneura notostigma laidlawi*, Förster,  
Fasc. Malay. Zool. Pt. IV. Odonata, Pt. 11,  
1907, p. 12. (sep.)

I have in my possession 2 ♂♂ specimens sent to me by the late Dr. Förster. The species is quite distinct from *notostigma*.

There is no trace of *Cu2*. The insect is almost entirely black, with a blue mark on either side of the ocelli, a rich blue band on either side of the prothorax; a very narrow complete band of the same colour on either side of the dorsum of the synthorax; the sides black (in the fully adult male) with a narrow blue line along the second lateral suture, and another along the ventral margin of the metasternite.

There is a longitudinal blue mark along the dorsum of the second abdominal segment, and the whole of segments nine and ten as well as the upper anal appendages are rich blue.

ii. *Platycneminae*.

32. *Copera marginipes* (Ramb.).

2 ♂♂. Selangor: Jungle near Batu Caves, Sept.

1 ♀. Selangor: near Setapak, Sept. 1926, C. Dover.

1 ♂, 2 ♀♀. Singapore, Oct. 1922, J. C. Moulton.

Taken also by myself at Kuala Aring, Kelantan, in Sept. 1899.

33. \* *Copera acutimargo* Krüger.

*Copera atomaria*, Laidlaw. Proc. Zool. Soc.  
London, 1902, p. 386.

*Copera acutimargo*, Ris. Tijdschrift v. Entomol.  
Deel LVIII, 1915, p. 7. figs. 1. 2.

(See also Ris. Zool. Mededeel. S'Rijks Mus. Nat.  
Hist., Leiden, X, Afl. I, 1927, pp. 17-19).

I have seen specimen from the Isthmus of Kra which agree exactly with examples from the Mentawi Islands. The true *atomaria* from Borneo is a totally distinct species.

The specimens recorded by me from Kuala Aring belong undoubtedly to *acutimargo*.

33. bis. \* *Copera annulata* (Selys).

*Copera ciliata* Laidlaw, Fasc. Malay. Zool. Pt.  
IV, Odonata, Pt. II, 1907, p. 8. (sep.)

This species has a wide range from India and China to Sumatra, whence it has been recorded by Ris.

34. *Calicnemis chaseni* Laidlaw.

*Calicnemis chaseni*, Laidlaw, Proc. Zool. Soc.,  
London. 1928, p. 138.

1 ♂. Perak; Batang Padang, Jor Camp, 1800', June  
4th, 1923, H.M.P.

A very handsome species, with crimson abdomen and scarlet markings on head and thorax, and black anal appendages. Belongs to a genus whose headquarters are in Assam.

35. *Indocnemis orang* (Förster).

*Trichocnemis orang*, Förster, Fasc. Malay., Zool.  
Pt. IV, 1907, Odonata, Pt. II, pp. 2-4. (sep.)

*Coelliccia* (?) *orang*, Ris, Supplementa Entomol.,  
I, 1912, pp. 67-68.

3 ♂ ♂. Pahang: Kuala Teku, 5 ♂ ♂ 2 ♀ ♀ Sungei  
Tahan, 350'-500', Feb. 1921, E. Seimund.

1 ♂. Pahang: Kuala Tahan, Nov. 1921, H.M.P.

5 ♂ ♂, 4 ♀ ♀. Peninsular Siam: Nakon Sri Tamarat, Khao Ram, 600-1200' Feb. 1922, H.M.P.

The original specimens, described by Förster were taken by Grübauer at Jor Camp, on the track to Cameron's Highlands, about 2000 ft. above sea level. It is unfortunate that the colouring of this species is largely destroyed by decay of the soft parts of the body after death. None of the nine males before me show the thoracic colours sufficiently well to be suitable for a detailed description. Further, very considerable age changes seem to take place so that scarcely two individuals of series are exactly alike.

To Förster's account of the male I can add that on the prothorax there is a small round bluish spot on either side of the middle lobe. Young males appear to have a narrow

blue band on either side of the dorsum of the synthorax, immediately internal to the humeral suture. In the young males also the sides of the synthorax are yellow, with a broad black band along the second lateral suture. The ground colour in front of this black band is perhaps rather blue than yellow.

In the adult male, the blue stripe of the dorsum of the synthorax seems to widen considerably, so as to form a large oblong-oval mark extending inwards almost to the mid-dorsal carina. At the same time the sides of the synthorax seem to undergo a melanotic change, the whole becoming almost black.

In all the males sufficiently perfect for examination, the distal half of the dorsum of the ninth segment of the abdomen and the whole dorsum of the tenth is blue. The anal appendages in young males are whitish-yellow, in adults black.

The female has the colouring of the young male, but the dorsum of distal half of the eighth segment of the abdomen, as well as the whole dorsum of the ninth are yellowish, the mark on the ninth segment broadens laterally towards the apex of the segment. The tenth is black.

Length of abdomen ♂ 47 mm—54 mm. ♀ 48 mm., of hind-wing ♂ 32–34 mm. ♀ 34 mm.

Excepting *Pericnemis* this species is the largest of the Malayan *Coenagruidae*.

The genus, which has the general proportions of a large *Coeliccia*, combines the long and rather narrow wing of *Coeliccia* with the relatively distal position of *Ac* found in *Calicnemis*. The female has also the posterior margin of the prothorax simple as in the latter genus.

Examples of the genus have been taken, beyond our faunal limits, in Assam (Laidlaw, Rec. Ind. Mus. XIII, 1917, p. 320, fig. 1.) in Southern China (Ris, loc. cit. supra) and in Hainan (coll. Brit. Mus.)

The specimens from Hainan appear to belong to an undescribed species: the Assam form has been named *kempi* by myself, but it must be admitted that it is doubtfully distinct from *orang*, whilst the position of the Chinese form remains unsettled.

The name *orang* is of course the Malay *orang* meaning man. I am sorry that I do not know why Förster gave the species this name.

### 36. *Coeliccia didyma* Selys.

*Coeliccia didyma*, Kirby, Cat. Odonata, p.

*Coeliccia simillima*, Laidlaw, Rec. Ind. Mus. 1917.

*Trichocnemis octogesima*, Laidlaw, (nec Selys),  
Fasc. Malay. Zool. Pt. IV, 1907, Odonata, Pt.  
II, p. 2. (sep.)

- 1 ♂. Peninsular Siam: Nakon Sri Tamarat, Khao  
Luang 2000' March, 1927, H.M.P.

Ranges from Assam to the north of the Malay  
Peninsula.

37. *Coeliccia erici* Laidlaw (fig. 3).

*Trichocnemis renifera* (race?)

Laidlaw, Fasc. Malay. (sep.) Odonata. Pt. ii,  
p. 2.

*Coeliccia erici*, Laidlaw, Rec. Ind. Mus. xiii, 1917,  
pp. 334-335. fig. 2.

- 1 ♂. (juv.) Perak: Batang, Jor Camp, 1500' June,  
1923, H.M.P.

- 1 ♂. Pahang: Kuala Teku, 14th Feb. 21, E. Seimund.



This specimen agrees exactly  
with the type and is in better  
preservation. I refigure the anal  
appendages, which in the type were  
rather distorted.

Fig. 3. *Coeliccia*  
*erici* Laidl. anal appen-  
dages ♂.

38. *Coeliccia albicauda* (Förster). (fig. 4).

*Trichocnemis octogesima albicauda*, Förster,  
Fasc. Malay., Zool. Pt. IV, 1907, Odonata, Pt.  
II, pp. 5-6, (sep.)

*Trichocnemis borneensis*, Laidlaw (nec Selys)  
loc. cit. pp. 6-7.

- 3 ♂ ♂, 2 ♀ ♀. Perak: Batang Padang, Jor Camp,  
1800' May-June, 1923, H.M.P.

- 1 ♂. Pahang: Lubok Tamang, 3500' June 1923,  
H.M.P.



Fig. 4. *Coeliccia al-*  
*bicauda* (Förster) anal  
appendages ♂.

This form is quite distinct from *octogesima* and is  
entitled to stand as a good species. My specimens were  
collected at Kuala Aring, in October. The species is appa-  
rently confined to the Peninsula.

38. bis. \* *Coeliccia octogesima* (Selys).

Taken by Wallace in Singapore. This is presumably one of the species of the genus in which the markings of the female synthorax are the same as in the male.

Fresh examples from the type locality, both sexes, are needed. I have seen a female probably of this species from Borneo.

39. *Coeliccia nigrescens* sp. n. (fig. 5).

1 ♂. Peninsular Siam: Nakon Sri Tamarat, Klawng Tadi, April, 1922, H.M.P. (holotype).

1 ♂. Nakon Sri Tamarat: Khao Luang, March 1922, 2000', H.M.P.

1 ♂. Nakon Sri Tamarat: Khao Ram, Feb. 1922. 1500-2500', H.M.P. (All in poor condition).

♂. (type). Length of abdomen 40 mm. of hind-wing 26 mm.

*Venation.* Quadrangle of fore-wing slightly shorter than that of hind-wing. Costal margin of quadrangles of both wings rather shorter than anal margin. *Rs* rises distal to subnodus, *M*<sub>3</sub> usually proximal to it. Three discal cells, (on the right hind-wing of one specimen there are four). Pterostigma dark gray, covering about one and half cells, deeper than the cell immediately preceding it, its inner and outer borders oblique, parallel. Postnodals twenty to twenty-two on fore-wing.

*Head:* black, the genae, bases of mandibles, a small spot on either side of the ocelli, and a small transverse, postocular mark on either side, blue.

*Prothorax:* black, its lateral lobes and ventral surfaces yellow.

*Synthorax:* dorsum black, with a large pair of diamond-shaped spots anteriorly, behind these a very small linear mark of blue. Sides blue with a complete band of black along the second lateral suture.

*Legs:* black, with a yellowish mark on the upper half of the anterior surfaces of the femora.

*Abdomen:* almost entirely black. There is a small blue lunule at the apex of the first segment on either side, and a lateral mark of the same colour on the second segment. The sides of the tenth segment are yellowish-blue.

**Anal appendages:** yellow, upper pair rather shorter than lower pair, seen from above club-shaped, with a strong ventrally-directed tooth, tipped with black near the apex, and a smaller tooth directed inwardly immediately basal to this. Lower pincer-like, hooked a little downwards, and tinged with darker colour at their apices.



Fig. 5. *Coelliccia nigrescens* sp. n. anal appendages ♂.

♀. unknown.

39. bis. \* *Coelliccia membranipes* (Ramb.).

Krüger gives "Malacca" as an habitat for this species, which is found in Sumatra and Java. A race (*nemoricola*) occurs also in Borneo.

iii. *Coenagriinae* = *Agrioninae* (sensu Selys.)

40. *Onychargia atrocyana* Selys.

1 ♂, 1 ♀. Selangor: Kuala Lumpur, June, 1921.  
H.M.P.

41. \* *Aciagrion borneense* Ris.

*Aciagrion borneense*, Ris. Ann. Soc. Entomol. Belgique, vol. 55, 1911, pp. 234-235, figs. 2-3.

Laidlaw, Proc. U.S. Nat. Mus. Vol. 66, Art. 10, p. 7. Pl. I. figs 2-3.

First recorded from Borneo (Sintang), I have seen specimens from the Peninsula and from Lower Siam (Dr. W. L. Abbott).

42. *Aciagrion hisopa* Selys.

(See Laidlaw, Proc. U.S. Nat. Mus. Vol. 66, Art. 10.)

4 ♂ ♂. 3 ♀ ♀. Singapore: Pulau Ubin.

2 ♂ ♂. Singapore Is.: Botanic Gardens.

1 ♀. Jalor: Biserat, Dr. Annandale.

43. *Pseudagrion pruinosum* (Burm.).

*Pseudagrion pruinosum*, Ris, Nova Guinea, Zool. XIII, p. 98, fig. 18.

1 ♂. Jalor: Kampong Mabek, July 1901. Dr. N. Annandale.

Ris (*loc. cit.*) gives Malacca as a record for this species.



44. \* *Pseudagrion microcephalum* (Ramb.).

*Pseudagrion microcephalum*, Laidlaw, Proc. Zool. Soc. London, 1902, II, p. 388.

Ris, Supplem. Entomol. V, 1916. pp. 40-43, fig. 14.

Recorded by myself from Trengganu, and by Ris from Singapore.

45. *Pseudagrion bengalense* Laidlaw.

*Pseudagrion bengalense*, Laidlaw, Rec. Ind. Mus. XVI, 2.8. 1919.

Ris, Zool. Mededeel. 's Rijks Mus. Nat. Hist., Deel IX, Afl. 1, pp. 23-25, fig. 11.

I have seen several specimens of this species from the Botanic Gardens, Singapore, sent to me by the late Major Moulton. The species occurs from the neighbourhood of Calcutta to Singapore and Sumatra, but is apparently local. It is found also I believe as far South in Peninsular India as Coorg.

46. *Archibasis melanocyana* (Selys).

*Stenobasis melanocyana*, Kirby, Cat., Odonata.

1 ♂ (?) Selangor: Ampang, Reservoir, June, 1922, H.M.P.

Fragmentary and discoloured.

Dr. Ris has pointed out to me (*in litt.*) that the genus *Archibasis* belongs to the *Pseudagrion* series, from which it may be regarded as a specialized offshoot. The structure of the female prothorax in the two genera is the same, and the anal appendages of the males very similar.

*Archibasis* may be recognized by the very small pterostigma and the untoothed tarsal claws.

47. *Ceriagrion pendleburyi* sp. n. (fig. 6.)

2 ♂ ♂. 31.5.23. 1 ♂ 1 ♀ (in cop.). 1.6.23.

All from Perak: Batang Padang, Jor Camp, 1800', H.M.P.

Resembles in colouring the group of species of which *melanurum* Selys was the first to be described, and in that group I think is most nearly allied to *cerinomelas* Lieftinck.

Length of hind-wing: ♂ 18 mm., ♀ 21 mm., of abdomen: ♂ 29 mm., ♀ 30 mm.

*Head*: brownish-yellow, darker on the vertex, with the postocular area marked off on either side by a fine black line.

*Prothorax*: brown, ridges marked with black.

*Synthorax*: dorsum, rather dark greenish-brown; there is a very fine black line along either side of the mid-dorsal carina, and the humeral sutures and alar ridges are also finely lined with black. Sides and under-surfaces yellowish-brown with a bluish-green, oblique band on the mesepimerite and a minute black dot at the upper end of the second lateral suture.

*Legs*: yellowish-brown, the joints and tarsi darker.

*Abdomen*: yellowish-brown, the first segment paler. The dorsum of segments seven to ten shiny black, except for a pair of small basal lunules of yellowish-brown, which do not quite meet in the middle line. Sides of seven, eight and ten yellowish-brown, those of nine black except along the extreme ventral margin.



Fig. 6. *Ceriagrion pendleburyi* sp. n. anal appendages ♂.

*Anal appendages*: upper and lower pairs of almost equal length, basal half of lower pair yellow, otherwise black.

Upper pair distant, straight, tapering toward the apex which is rather acuminate, with a small, blunt, ventro-internal projection at about two thirds of the total length disally. Lower pair with inflated bases, suddenly narrowing and inclining a little inwards and upwards, rather like those of *cerinorubellum*.

♀. Generally similar to the male, but colours duller. In the abdomen, the whole of the dorsum of the sixth segment is black, otherwise as in the male. Post-nodal nerves 13 13

11 11

The species differs from its immediate allies in details of the anal appendages of the male.

It differs further from *cerinomelas* in the ground-colour of the male abdomen, which in that species is described as yellowish-white, the basal half of segment seven being of the ground-colour. In the female of *cerinomelas* the sixth segment of the abdomen has a black apical mark only on the dorsum.

The two other similarly coloured species differ markedly from *pendleburyi* and from each other in the shape of the anal appendages of the males. The female of *melanurum* Selys has the terminal segments of the abdomen not darkened, on segments eight to nine only a fine black basal ring. The female of *fallax* Ris, is unknown.

*C. cerinomelas* Lieftinck is known from near Simla in N. India., *melanurum* Selys is recorded from Japan, China, and Sumatra., *fallax* Ris., was described from examples from Kwang-Tung in S. China.

It is possible that the Sumatran specimens ascribed to *melanurum* may belong rather to *pendleburyi*.

48. *Ceriagrion cerinorubellum* (Brauer).

2 ♂♂. Singapore Is.: Padan and Buloh River, June-July, 1922, F. N. Chasen.

The species ranges from India to Borneo. Local races will probably prove distinguishable.

49. *Ceriagrion erubescens* Selys.

I collected examples of this species near Kota Bharu, Kelantan, in Nov. 1899.

One male was also taken by Dr. Annandale at Biserat in Jalor, July, 1901.

It is a smaller species than *coromandelianum*, and has the upper anal appendages black instead of greenish-yellow. Its general colouring is also redder, otherwise the two are closely allied.

♂ Length of abdomen 27.5 mm., of hind-wing 17 mm.

50. \* *Ischnura senegalensis* (Ramb.).

1 ♂. Peninsular Siam: Patani, Dr. N. Annandale, April, 1901.

51. *Agriocnemis rubeola* Selys.

2 ♂♂, 3 ♀♀. Singapore Gardens, July 1922, F. N. Chasen.

2 ♀♀. Selangor: Kuala Lumpur, Sept. 1923, H.M.P.

52. *Agriocnemis femina* Brauer.

*Agriocnemis femina*, Ris, Suppl. Entomol., No. V, 1916. pp. 2226-22-26.

*A. incisa* Laidlaw, Proc. Zool. Soc. London, 1902, II, p. 388.

*A. pulverulans*, Laidlaw, loc. cit. supra.

2 ♂♂, 1 ♀.

1 ♂, ♀♀. (in bad condition) Singapore.

Recorded from Penang, Singapore, and Kota Bahru, Kelantan.

Ranges pretty well all over the Orient.

53. *Agriocnemis pygmaea* (Ramb.).

(See—Ris, Suppl. Entomol., No. V, 1916, pp. 20-22).

This species is recorded for Singapore by Rambur. It ranges from the Seychelles Is. to Australia.

54. *Agriocnemis nana* Laidlaw.

*Agriocnemis nana* Laidlaw. Rec. Ind. Mus. viii, Pt. iv, p. 348, Pl. xvi, fig. 10, (1914).

1 ♂. Pahang: E. Coast, Beserah, May, 1926, H.M.P.

I have been able to compare this tiny dragonfly with a long series of the same species from Burma, and can find no differences. It is characterised by the blue upper lip with a very narrow line of black at its base, the anteclypeus is blue and postclypeus black with a fine blue margin above it. Slender, comma-shaped postocular spots, connected by a very fine line across the occiput. The prothorax is black with blue anterior margin, the posterior margin very finely outlined with white, carrying a median, rectangular projection which is slightly indented at its middle. The dorsum of synthorax is velvety black with fine whitish-blue humeral stripes. Sides blue, fading to white below. The ground colour of the abdomen is whitish-blue with bronze black markings on the dorsum of the first seven segments, that on the second enclosing a pair of blue oval spots. The eighth segment is unmarked, and the ninth and tenth are entirely black. (In some specimens from Burma there is a small basal mark on the dorsum of the eighth and a varying angular pattern of blue on the dorsum of the ninth).

Upper anal appendages blue, conical, with a large basal spur. Lower pair small, bifid.

Pterostigma greyish-white, darker near its anal border.

55. *Agriocnemis d'abreu* Fraser.

*Agriocnemis d'abreu*, Fraser. Mem. Dept. of Agriculture in India, Entomol. Series, vol. VII, No. 7, 1922, pp. 52-53, Pl. VI. fig. 1.

1 ♂. Pahang: E. Coast, Beserah, May, 1926, H.M.P.

Differs from Fraser's specimens only in having the dorsum of the sixth segment with a dark longitudinal band, and the three last segments without dark markings.

There are also in the collection of the F.M.S. Museum three female specimens, with the same data, whose exact position is doubtful. I suspect that they will prove to belong to *nana*. They are all russet brown in colour, paler below, without definite markings. The brown shades into black on the top of the head, and otherwise is darker on segments 7-8 of the abdomen than elsewhere. The legs are whitish, with black ciliae and articulations.

A fourth female from the same locality is almost entirely black. The upper lip is whitish-yellow with a black basal mark. The humeral stripes which are very narrow are orange in colour, and there are some obscure blue black markings on the sides of segments 2-6 of the abdomen. This is probably a female of *d'abreui*. Fraser does not seem to have found any orange females of this latter species.

This and the preceding species of the genus are the smallest of all *Odonata*. The length of the hind-wing is as little as 9 mm. in the males. Lieftinck (*infra*) gives 8.75 mm. In spite of their small size they are very beautiful insects.

The occurrence of the two last named species so far South is interesting. It is possible that careful collecting will reveal the existence of yet other species, and observations on the females, which are usually dimorphic in this genus are bound to be of interest. *Agriocnemis* is an insect that haunts padi-fields and is found in cultivated country.

56. \* *Pericnemis stictica* Selys.

*Pericnemis stictica*, Laidlaw, Proc. Zool. Soc. London, 1902, II, p. 386.

Ris, Zool. Mededeel., 'S Rijks Museum, Nat. Hist. Leiden. X, pp. 25-26, 1927.

Taken by myself at the foot of Gunong Inas, Perak. (Jan. 1900). Ris records the species from Borneo, Sumatra, and Java. One of the most remarkable of the Coenagrions, rivalling in size such forms as *Vestalis* or *Neurobasis*, but with the venation of a *Teinobasis*.

57. \* *Teinobasis ruficollis* Selys.

*Teinobasis ruficollis*, Ris, Zool. Mededeel. 'S Rijks Mus. Nat. Hist. Leiden, 1927, p. 25.  
Kirby, Cat. Odonata, p. 157.

The type male is said by de Selys to have been taken by Wallace in Singapore. Ris records the species from Sumatra.

58. \* *Teinobasis kirbyi* Laidlaw.

*Teinobasis kirbyi*, Laidlaw, Proc. Zool. Soc. London, 1902, II, pp. 386-387.  
*Teinobasis kirbyi* (?), Laidlaw, Proc. Zool. Soc. London, 1920, pp. 337-338, fig. 4.

The type much damaged, was taken by me on Gunong Inas, in Perak in December, 1899.

Sub-Order ANISOPTERA.

Family CORDULEGASTRIDAE.

Sub-family Chlorogomphinae.

59. \* *Orogomphus dyak* Laidlaw.

*Orogomphus dyak*, Laidlaw, Journ. Str. Br. R. As. Soc. 1911, pp. 191-192.

I have seen a single male of this species, from Johore, in the collection of the Raffles Museum.

Described from specimens from Borneo.

Family AESCHNIDAE.

60. *Caliaeschna laidlawi* Förster.

*Caliaeschna laidlawi*, Förster, Ann. Soc. ent. Belg. LII, 1908, pp. 213-214.

1 ♀. Perak: Batang Padang, Jor Camp, 2000', June 2nd. 1923, H.M.P.

1 ♀. Same locality: October 19th. 1923, (evening) H.M.P.

Both specimens are very immature. The generic position of this form is quite uncertain, but pending a generic revision of the *Brachytron* series of genera it may be left in its present place.

The dentigerous plate of the female is like that of *Periaeschna*, the small pterostigma gives it quite a different facies from the species of that genus.

61. \* *Jagoria modigliani* (Selys).

*Jagoria modigliani*, Ris. Ann. Soc. ent. Belg. LV, 1911, p. 240-242.

Karsch described a male from Singapore (?) under the name *poeciloptera*. Ris (*loc. cit.*) records a female from Perak.

62. *Indaeschna grubaueri* (Förster).

*Amphiaeschna grubaueri*, Martin. Cat. Coll. Selys, pp. 115-116, fig. 119.

*Indaeschna grubaueri*, Fraser, Treubia, 1926, pp. 474-475.

4 ♂ ♂. Peninsular Siam: Nakon Sri Tamarat, Khao Ram, 700'-2000', Feb.-March 1922, H.M.P.

1 ♀. Pahang: Fraser's Hill, 4200', Sept. 4th. 1923, M. R. Henderson.

1 ♂. Selangor: Gombak Valley, Oct. 23rd. 1921, H.M.P.

1 ♂. Negri Sembilan: Bukit Tangga, 1200', Sept. 1915, C. B. Kloss.

Fraser has removed this species from the genus *Amphiaeschna* (type *ampla* (Ramb.) ), and it becomes accordingly the type of his genus *Indaeschna*.

I believe that this genus at present includes only one species, and that Martin's species *perampla* is synonymous with *grubaueri*. I have seen a specimen of the latter from Borneo, whilst Fraser (*loc. cit.*) records it also from Java. Martin in the Catalogue gives Java and Borneo as the habitats of *perampla*.

I may remark in passing that the figure given of the wings of the female of *Amphiaeschna perampla* by Martin in the Selysian Catalogue is really a figure of the wings of *ampla*. This was pointed out to me by Dr. Ris (*in litt.*) some time ago.

63. *Heliaeschna idae* (Brauer).

*Heliaeschna idae*, Krüger, Stettin Ent. Zeit. 1898, pp. 323-324.

Martin, Cat. Coll. Selys, pp. fig.

Ris, Ann. Soc. ent. Belg., LV, 1911, pp. 242-243, fig. 10.

1 ♂. "Malay Peninsula."

1 ♂. Selangor: Kuala Lumpur, T.C.N. 4-23.

1 ♂. Selangor: Batu Tiga, Seafeld Estate, 23.11.20. E. H. Nore.

1 ♂. Selangor: Kuala Lumpur, "At light" 4.26. H.M.P.

1 ♂. Selangor: do. do. 9.26. H.M.P.

The anal appendages of the male of this species are very like those of *crassa* Krüger, almost identical in fact in appearance but the upper pair are slightly shorter, and the lower appendage is also distinctly shorter than in that species.

*Crassa* has the wings of both sexes coloured a rich brown, whilst *idae* male has uncoloured wings, and the female has a costal band, and a transverse belt distal to the nodus, on the forewing alone, of a brown colour.

Length of abdomen ♂ *idae* 50 mm. ♂ *crassa* 52 mm., of upper anal appendage ♂ *idae* 7 mm. ♂ *crassa* 7.5 mm. (The subcostal and costal space at the extreme base of all four wings of *idae* is tinged with deep brown) *crassa* is recorded for Borneo only, but I have before me a specimen (♀) from the Natuna Is.

64. *Tetracanthagyna plagiata* Waterhouse.

(see) *Tetracanthagyna vittata*, Ris, Ann. Soc. Ent. Belg. LV, 1911, pp. 243-244.

*Tetracanthagyna plagiata*, Martin, Cat. Coll. Selys. Aeschnines, pp. 145-146, figs. 144-145.

1 ♂. Pahang: Senyum and Kota Tongkat, June-July, 1915.

1 ♀. Same data.

Length of hind-wing ♂ 72 mm. ♀ 83 mm.

The specimen of which the two wings are figured by Martin in the Selysian Monograph is a male but the hind-wing near the anal angle has been contorted to some extent.

The anal appendages of the male are exactly as figured in the same account, and rather different from the figure of *vittata*.

**65. *Tetracanthagyna brunnea* MacLachlan.**

*Tetracanthagyna brunnea*, Martin, Cat. Coll. Selys, Aeschnines, pp. 146-147.

1 ♀. Selangor: Ulu Langat, Nov. 1916?

Length of hind-wing 67 mm.

The male of this species remains unknown.

**66. *Gynacantha subinterrupta* Rambur.**

*Gynacantha subinterrupta*, Ris, Nova Guinea, XIII, Zool. Livr. 2 pp. 110-111, fig. 36.

1 ♂. Selangor: Kuala Lumpur, Sept. 1926, "at light," H.M.P.

1 ♀. Selangor: Kuala Lumpur, Sept. 1926, "at light," H.M.P.

3 ♀ ♀. Selangor: Kuala Lumpur, Dec. 1921. Sept.-Nov. 1922, H.M.P.

2 ♀ ♀. Selangor: Setapak Pond, Aug. 1926, C. Dover.

These specimens are all much faded and show nothing of the original colouring.

For want of adequate material I still find it difficult to make up my mind whether this form is really *subinterrupta* or whether it should not rather be regarded as *hyalina* Selys.

*G. subinterrupta* has a more southerly distribution on the whole, and with a note of doubt I refer these specimens here. See Ris. Supplementa Entomologica No. V, 1916, pp. 59-61.

**67. *Gynacantha bayadera* Selys.**

*Gynacantha bayadera*, Ris. Nova Guinea, XIII, Zool. Livr. 2 pp. 111-112, fig. 35.

1 ♀. Selangor: Kuala Lumpur.

1 ♀. Singapore Island: Mandai, 7.1.23. B. Abraham.

**68. *Gynacantha risi* sp. n. (fig. 7.).**

1 ♂. (adult) Perak: Batang Padang, Jor Camp, 2000', Aug. 21, 1922, E. Seimund.

Length of hind-wing 55 mm. of abdomen 50+9 mm.



**Head:** upper lip orange-brown, face greenish-brown deepening at the apex of the frons to dark brown with a suggestion of a metallic tinge at extreme apex. On the horizontal part of frons a dark T-shaped mark, the vertical limb of the T narrowing posteriorly.

**Thorax:** dull brown apparently entirely unmarked, darker on the dorsum.

**Legs:** uniformly brown.

**Wings:** tinged with brown at the extreme base, otherwise uncoloured. Pterostigma yellowish-brown, 4 mm. in length.

Nodal index	26	30		30	25
	30	22		23	31

**Abdomen:** auricles very large, third segment strongly constricted. Colouring generally dull brown, darker above, but the colours have evidently faded badly.

Segments one and two are evidently lighter than the others and there are indications of light apical rings, probably blue or green in the living insect, on segments three to six, as well as similar rings behind the transverse carinae on those segments.

**Anal appendages:** upper dark brown, long and slender, the distal halves widening gradually to form flattened liminae, each of which terminates in a fine, rather out-turned point. The length of the upper pair is about 9 mm. Lower appendage rather more than a third the length of upper pair, brown at the base becoming paler apically.

This fine species is distinguished from most other Malaysian species by its greater size. It is exceeded



Fig. 7. *Gynacantha risi* sp. n. anal appendages ♂.

in this only by *limbalis*, which is still larger, but *limbalis* has the wings coloured, and a relatively longer pterostigma, and the shape of the anal appendages of the male is different, the upper pair being straighter and increasing in width more gradually. The anal appendages of *risi* resemble in shape more those of *macLachlani* than any other species, but *macLachlani* is a much smaller insect, (hind-wing 45 mm.).

I have great pleasure in associating this species with the name of the late Dr. F. Ris.

69. *Gynacantha basiguttata* Selys.

*Gynacantha basiguttata*, Ris. Ann. Soc. Entomol. Belg., LV, 1911, pp. 246-247, fig. 13.

1 ♂. Selangor: Kuala Lumpur. At light. 30.1.22.  
H. C. Abraham.

1 ♀. Perak: F.M.S. Museum. Taiping, Perak.

70. *Gynacantha limbalis* Karsch.

1 ♀. Perak. Perak Museum. Taiping.

This is the largest of the Malayan species of the genus. The specimen is immature but shows something of the band of brown colour along the costal margins of the wings. The third segment of the abdomen is very markedly constricted.

The species has hitherto been recorded from Java only. Length of hind-wing 63 mm.

71. *Anax guttatus* (Burm.).

(See Laidlaw, Rec. Ind. Mus. XXII, pp. 82-84. *ibid.*, Proc. U.S. Nat. Mus. Vol. 62, Art. 21, p. 12, 1923.).

1 ♂. Pahang: Kuala Tahan, Nov. 1922, H.M.P.

1 ♂. Selangor: Bukit Kutu, 3400', April 1926, H.M.P.

1 ♀. Malay Peninsula. (No other data).

1 ♀. Selangor: Kuala Lumpur.

2 ♀ ♀. Selangor Coast: Pulau Angsa Lt.-Ho. At light, Sept. 27, 1926, E. Seimund.

GOMPHIDAE.

Tribe Hageniini.

72. \* *Sieboldius japonicus* Selys.

*Sieboldius grandis*, Laidlaw, Proc. Zool. Soc. London, 1902, I, pp. 82-83, Pl. VI, figs. 3, 3a, 4.

*S. japonicus*, Williamson, Proc. U.S. Nat. Mus. XXXIII, p. 285, fig. 11, 1907.

I caught a single male of this species in thick forest at the foot of Gunong Inas, Perak, about 1000 ft. Jan. 1900.

Tribe Ictinini.

73. *Ictinus melaenops* Selys.

1 ♂. Selangor: Batu Caves, Nov. 1924, C. Dover.

1 ♂. Selangor: 6th mile, Ampang Road, Kuala Lumpur, Aug. 1924, H.M.P.

74. **Gomphidia perakensis** Laidlaw.

*Gomphidia perakensis*, Laidlaw, Proc. Zool. Soc. London, 1902, I, pp. 81-82, Pl. VI, figs. 1-2.

1 ♂. Perak: Batang Padang, Jor Camp, 1800', 2.6.1923. H.M.P.

1 ♂. Pahang: Kuala Teku, Feb. 1921, E. Seimund. 550'.

## Tribe Gomphini.

## Series HELIOGOMPHUS.

75. \* **Heliogomphus kelantanensis** Laidlaw.

*Gomphus consobrinus*, Laidlaw, Proc. Zool. Soc. London, 1902, I, p. 80, Pl. V, fig. 5 (nom. praeocc.).

*Gomphus kelantanensis*, Laidlaw, Proc. Zool. Soc. London, 1902, II, p. 382, (foot-note).

*Heliogomphus kelantanensis*, Laidlaw, Proc. Zool. Soc. London, 1925, p. 444, fig. 2.

This is a slightly aberrant member of its genus, only the type specimen is known.

76. \* **Microgomphus chelifer** Selys.

*Microgomphus chelifer*, Kirby, Cat. Odonata, p. 63.

Recorded by de Selys from Mt. Ophir Malacca, where it was taken by Wallace. I have seen a specimen from Borneo and the species occurs also in Sumatra.

77. \* **Macrogomphus thoracicus** McLachlan.

*Macrogomphus thoracicus*, Kirby, Cat. Odonata, p. 63.

I have seen a single male specimen of this fine species from Perak.

78. **Macrogomphus albardae** Selys.

*Macrogomphus albardae*, Selys, 4 mes. Addit., Synops. Gomph., p. 8, 11, sep. (1878).

id., Ann. Mus. civ. Genova, 27, p. 469, (1889).

Karsch, Ent. Nachr. 17, p. 244, (1889).

Kruger, Stettin. Ent. Zeitg. 59, p. 300, (1891).

This species has not hitherto been recorded from the Peninsula. The F.M.S. Museum collection contains a single male specimen from Peninsular Siam, Nakon Sri Tamarat collected in February 1922, taken on the Tai Sai River at the foot of Khao Ram by H. M. Pendlebury.

## Series EPIGOMPHUS.

79. *Leptogomphus* sp. ? *lansbergei*.

1 ♀. Perak: Batang Padang, Jor Camp, 1800', June 1923, H.M.P.

This female belongs to a species which has in all probability not been described, but until the male is available I prefer not to give it a name.

The genus is of great interest. It appears scarcely distinct from the S. American genus *Epigomphus*, and is the only Asiatic genus of Gomphine that shows, so far as I know, any indication of relationship to the S. American fauna.

The two genera have a general resemblance in venation. In addition both have rather slender abdomen (whence I imagine the generic name *Leptogomphus*), the males of both have the dorsum of the tenth segment of the abdomen studded with regularly arranged groups of small tubercles, at least in several species, and in both there is a striking and very similar sexual difference in the armature of the legs. Lastly in both the females have a curious development of ridges on the vertex behind the ocelli, which has probably to do with the coupling of the sexes.

The species of *Leptogomphus* already known are few in number and mostly described from few individuals. Of the Malayan forms *lansbergei* has been recorded from Java, and its race *assimilis* from Sumatra and the Mentawi Islands; a race occurs also in Borneo, I have seen an example from near Sandakan. A second species *williamsoni* Laidlaw is known from Borneo: this is a small species (♂ hind-wing 25 mm.) characterized by the presence of a yellow spot on the dorsum of the tenth segment of the abdomen.

Williamson (Proc. U.S. Nat. Mus. XXXIII, p. 291, fig. 17.) records *semperi* also from Borneo, apparently on the authority of Martin (Mission Pavie, sep. p. 11). He does not seem to have seen the species himself. *L. semperi* was described originally by de Selys (4 additions. Syn. Gomph.) from a unique male from Mindanao. The distribution of oriental Gomphines is as a rule fairly restricted, and though Martin (*loc. cit.*) gives Philippines, Tonkin and Borneo as the range of this species, I think it probable that the true *semperi* does not occur in Borneo. The figure of the wings given by Williamson for *semperi* (*loc. cit.*) can scarcely enable one to distinguish it from *lansbergei*, though it is fair to add that in the example of the latter from Borneo now before me, the pterostigma seems slightly shorter relatively. At any rate I think that *semperi* must be recorded with a query for Borneo.

Krüger's species *gracilis* from Sumatra (Krüger Stettin Entomol. Zeit. pp. 302-306) is not a *Leptogomphus* but as Ris has shown is rather a typical *Heliogomphus* (Ris, Zool. Mededeel. 's Rijks Mus. Nat. Hist. Leiden, x, i, 1927, pp. 27-28, figs. 12-13). Lastly Krüger's species *parvus* also from Sumatra (Krüger *op. cit.* pp. 308-311) is still imperfectly known, and is certainly not a *Leptogomphus*.

The specimen from Jor is briefly described below.

Length of abdomen 37 mm. of hind-wing 32 mm.

*Head*: black marked with yellow. Upper lip largely yellow, with a black anterior border which indents deeply the yellow in the middle line, but does not completely divide it into two spots, as in *lansbergei*. The bases of the mandibles are also yellow, as is the bilobed, horizontal, part of the frons. Otherwise the upper surface of the head is black. Behind each of the posterior ocelli there is a transverse ridge-like elevation. The occiput carries a pair of blunt conical processes.

The dorsum of the *prothorax* appears to be dark brown, but the colouring of the specimen is not well preserved.

*Synthorax*: dorsum black, with a short, complete (?) mesothoracic collar, which is joined on either side by a narrow, yellow, anti-humeral stripe. Outside this stripe there is a more laterally placed stripe on either side, this is narrow and apparently obsolete in the middle part.

*Legs*: black, posterior pair of femora brown.

*Abdomen*: apparently entirely black, save for the dorsum of the first segment, and for lateral marks on the second and third segments. The auricles, which are well developed, are yellowish-brown.

The vulvar scale is long, narrow and deeply cleft, reaching to about the middle of segment nine.

Nodal indicator	12	15		15	12	The basal post-costal
	10	11		11	10	

nerve is absent on the R. fore-wing, and on both hind-wings. A good instance of the difficulty of defining Gomphine genera by venational characters alone.

#### Series CYCLOGOMPHUS.

##### 80. *Merogomphus femoralis* sp. n.

1 ♂. Selangor: Kuala Lumpur, June 6th, 1921, H.M.P.

The specimen is the type.

Length of abdomen 32 mm. of hind-wing 26.5 mm.

Nodal index	10	15		14	10
	9	10		10	9

Triangle of hind-wing rather long and narrow, distinctly separated from *M*<sub>4</sub> by a short stalk. Pterostigma braced. Basal post-costal nerve present on all wings except the R hind-wing. Three cross-nerves between *M*<sub>4</sub> and *M*<sub>3</sub> two on R. fore-wing otherwise these cross-nerves are fully spaced out. Venation otherwise much less dense than in *paviei* the genotype, which is a much larger species.

*Head*: lower lip white, upper surfaces entirely black except the horizontal part of the frons which is greenish-yellow.

*Prothorax*: black with a yellow spot on either side.

*Synthorax*: black, with a pair of narrow antehumeral stripes of greenish-yellow confluent with the mesothoracic collar of the same colour which is widely interrupted in the middle line. Sides greenish-yellow edged broadly with black, and with a broad black line on each of the lateral sutures.

*Legs*: black, hindermost femora very long extending to the apex of the third abdominal segment, armed with a double row of long spines, four or five in number, between which lie regularly arranged minute denticles.

*Abdomen*: black, slender, segments eight to nine and apical part of seven dilated ventrolaterally, and with a distinct but narrow exfoliation. Segment one with a narrow apical ring of greenish-yellow, two with a narrow dorsal, longitudinal line of the same colour and also the auricles.

Segments three, four and five with a small dorsal, apical mark of the same colour, seven with a quadrate mark occupying about its basal third; the rest entirely black.

*Anal appendages*: upper pair whitish, small, pointed, rather lyrate, with a black mark basilaterally, and with a microscopic black tooth externally at about the middle of their length. Lower appendage black, its branches divaricate, about as long as the upper pair.

*Female unknown.*

In spite of its much smaller size this species is unquestionably congeneric with Martin's species. I have been able to compare it also with Fraser's *Indogomphus longistigma* and *martini* and am forced to the conclusion that these species are also to be referred to the same genus. Important points of agreement are to be found in the venation, in the colouring, in the great length and armature of the femora, and in the structure of the male anal appendages. Martin's definition of the genus is not altogether complete (Martin, Mission Pavie. sep. Nevropteres. pp. 11-12.) and Williamson deals only with the venation. (Williamson, Proc. U.S. Nat. Mus. XXXIII, p. 317, fig. 30.).

But the accumulation of evidence afforded by a consideration of all the characters is sufficient to lead one to the conclusion stated above.

The genus *Merogomphus* then will include the following species.

*Merogomphus paviei* Martin. Tonkin.

*longistigma* (Fraser). India. (S.).

*martini* (Fraser). Bengal.

*cerastes* (Selys). Nepal.

*femoralis* sp. n. Malay States.

The affinities of this genus are I believe with the genera which belong to what I call the *Cyclogomphus* series. Its nearest ally seems to be the genus *Anisogomphus*. Characters which serve to mark this alliance are: the long triangle of the hind-wing, the occasional tendency for an irregularity of the spacing out of the cross-nerves between *M*<sub>4</sub> and *M*<sub>3</sub>-*M*<sub>2</sub>, the length and armature of the femora, and the coloured upper pair of anal appendages of the male. Genera of this series are found in tropical Africa, and on the mainland of tropical Asia, especially in India. *M. femoralis* has so far as I know, the most southerly distribution of any species in Asia.

#### Series GOMPHUS.

##### 81. *Burmagomphus seimundi* sp. n.

1 ♂. Pahang: Kuala Tahan, 350', March 1921, E. Seimund.

1 ♀. Pahang: Sungei Tahan, Feb. 1921, E. Seimund.

Förster has reported the occurrence of a species of *Burmagomphus* which he regarded as *vermicularis*, from Jor, taken by Grubauer. This is almost certainly the same form as that described here. (Förster, Archiv. f. Naturgeschichte 80, 1914, pp. 75-76.) Closely related to the Burmese species of which it is a local race. It is the smallest form of the genus hitherto described, except possibly *siamensis* Fraser.

♂. Length of abdomen 25 mm. of hind-wing 21.5 mm.

*Head*: upper lip black with a pair of large yellowish-green spots one on either side of the middle line, genae of the same colour, as is a pair of spots on either side of the post-clypeus. Horizontal part of frons also yellowish-green, with a fine black, median line. Rest of upper surface of head black.

*Prothorax*: black, with a greenish-yellow spot on either side.

*Synthorax*: dorsum black, with complete meso-thoracic collar, and a dorsal stripe running obliquely from near the alar sinus on either side, downwards and outwards, to the base of the second pair of legs. As Fraser points out this stripe is formed by the union of the upper part of an ante-humeral stripe with the lower part of a humeral stripe, the junction being marked by a bending and sudden broadening of the whole. This type of marking is very characteristic of the section of the genus to which this species belongs. Sides yellowish-green, a black stripe incomplete above on the first lateral suture, and a similar but complete stripe on the second lateral suture.

*Legs*: black. Coxae and anterior surfaces of first pair of femora yellowish.

*Abdomen*: slender, black, marked with yellow as follows. Lateral, and median dorsal spots on the first segment. Second segment with fine basal ring and narrow, longitudinal mid-dorsal band. Segments three to seven with small dorso-lateral lunules basally. Ninth segment with a narrow, apical ring, covering about one-sixth of the total length of the segment. There is a trace of the median apical spine which is found on the males of other species of this section of the genus. *Anal appendages*: black: upper pair of about the same length as the tenth segment, widely divaricate; each tapering to a point on the outer side of which the appendage has the appearance of having been bevelled away a little, the margin of the bevelled part studded with very minute teeth. Lower appendage deeply cleft into two branches which are even more widely divaricated than the upper pair. Each branch ends in a minute upturned point.

Nodal index	8 — 13		13 — 8
	8 — 9		9 — 9

♀. Length of abdomen 29 mm. of hind-wing 24.5 mm.

The specimen is immature and in poor condition. The colouring of the head and thorax does not differ from that of the male. The markings of the abdomen are so discoloured that it is impossible to make them out clearly, but they appear to resemble those of the male.

Nodal index	9 — 13		13 — 9
	9 — 9		9 — 9

The occiput in this sex carries a number (about 6) of irregularly placed, slender spine-like processes.

The immediate allies of this species are the members of the *vermicularis* section of the genus.



Excluding *siamensis*, of which the male is unknown, it differs from them all in the absence of the spine on the apex of the ninth segment of the male abdomen, and in the narrow yellow mark on the apex of that segment. The female differs from the type of *siamensis* in having the occiput black, and in possessing occipital spines. So far as one can judge from a poorly preserved specimen *seimundi* has also much more restricted markings on segments four to six of the female abdomen.

See Fraser "Indian Dragonflies, Part XXIV, Journal Bombay Nat. Hist. Soc. 1926."

Series ONYCHOGOMPHUS.

82. *Mesogomphus capricornis* Förster.

Förster, Archiv. f. Naturgesch, 80, 1914, pp. 79-80.

1 ♀. 6th. Mile, Selangor, Kuala Lumpur, Rawang Road, 5.10.24. H.M.P.

1 ♀. Selangor: Kuala Lumpur, F.M.S. 6.24. H.M.P.

I have also seen a male from Singapore.

The specific name is very happy as the anal appendages of the male are shaped exactly like a tiny pair of chamois horns.

The genus ranges from Africa to Celebes, but has not yet been recorded from Sûmatra or Borneo.

83. \* *Onychogomphus saundersi* Selys.

*Onychogomphus saundersii*, Selys, Bull. Acad. Belg. XXI, (2), p. 31, 1854.

Kruger, Stett. Ent. Zeit. ix., p. 295, (1898).

Williamson, Proc. U.S. Nat. Mus. XXXIII, pp. 310, 311, 312—figs. 29, (13) 35, 36, (1908).

Campion, Journ. Fed. Malay States Mus. VIII, (iii) pp. 162-163.

*Onychogomphus geometricus nigrescens*, Laidlaw, Proc. Zool. Soc. London.

1 ♀. Kelantan: Kuala Aring, 10. 99 (Skeat Expedition).

84. \* *Acrogomphus malayanus* Laidlaw.

*Acrogomphus malayanus*, Laidlaw, Proc. Zool. Soc. London, 1925, pp. 443-444, fig. 1.

The unique type is from Pulau Aor, off the E. Coast of Johore, and is now in the British Museum.

The genus *Acrogomphus* was instituted by me (*loc. cit. supra*) for a large Indian species (*A. fraseri* Laidlaw) and for *malayanus*. I regarded the genus as belonging to the *Epigomphus* series, but have now changed my opinion and believe that it must be looked on as belonging to the

*Onychogomphus* group, of which it is perhaps the most primitive member. The type species (*fraseri*) has the cross-nerves between  $M1 + 3$  and  $M4$  spaced out to a varying extent in different individuals; in *malayanus* the

single known male shows the following formula  $\frac{4}{3} \mid \frac{4}{3}$  whilst

the pair of the new species described below have the full spacing out of these cross-nerves characteristic of other genera of the group. I think these can be no doubt whatever as to these species being congeneric, so that we have to deal here with a certain amount of variability, which may be individual, in this character. A similar state of affairs occurs in individuals of the genus *Cyclogomphus*.

The genus in other respects, and especially in the structure of the terminal segments of the male abdomen, seems to be related to *Onychogomphus*, and is I think best referred to this group. It may even to be a link between the more typical genera of the group and the splendid *Megalogomphus* (*Heterogomphus*); this latter has never been recorded from the Peninsula, but as it occurs in Burma and Siam as well as in Borneo, Sumatra and Java we may expect that sooner or later our fauna will include it.

In addition to *fraseri*, *malayanus*, and *minor*, de Selys' species *circularis* must be included in the genus *Acrogomphus*. On comparing the types of *minor* with his description of *circularis* the resemblances are so great that I was for a time inclined to regard my new species as really belonging to *circularis*. Though I have decided to give it a name I am quite prepared to admit the likelihood of its being a small local race of de Selys' species.

Perhaps Forster's *Heterogomphus naninus* will prove to be another close ally. I suggest the following definition for the genus *Acrogomphus*.

Dragonflies of the *Onychogomphus* series, in some species or individuals of which the spacing out of the cross-nerves between  $M1+3$  and  $M4$  is not fully fixed. Colouring black, with yellow or greenish-yellow markings. Size moderate or rather large (hind-wing 25 mm. to 40 mm. according to species) males with small narrow exfoliation on segments eight, nine of abdomen, and with long, distant, upper anal appendages.

#### 85. *Acrogomphus minor* sp. n.

1 ♂. Selangor: Kuala Lumpur, July 1922, H.M.P.

1 ♀. Peninsular Siam: Patalung, Koh Wangse, at light, May 1924, I. H. N. Evans.

♀. Length of abdomen,  $33 + 2$  mm. of hind-wing 25 mm.

*Head*: black marked with yellow. Upper lip yellow with black margin and base, united by a narrow longitudinal black line. Genae, bases of mandibles and anteclypeus, horizontal part of frons, as well as occiput, yellow.

*Prothorax*: dorsum black with yellow anterior margin; sides and under surfaces yellow.

*Synthorax*: dorsum black, with yellow mesothoracic collar, narrowly interrupted in the middle line. A pair of oblique humeral stripes incomplete above and below of the same colour, and to the outside of the upper end of these on either side a small linear mark of yellow. Sides and under surface yellow, with a black line along each of the lateral sutures. The posterior margin of the synthorax is not margined with black laterally.

*Legs*: Coxae yellow. First and third pairs of femora largely yellow, with black spines and black markings posteriorly second pair almost entirely black. Tibiae and tarsi black.

*Abdomen*: black marked with yellow as follows. First segment yellow with a black dorso-lateral mark on either side. Second segment with a elongate yellow triangle on the dorsum, enclosed by a black line on either side. Laterally yellow. Segments three to seven each with a basal yellow mark, that on seven occupying the basal half of the segment, those on three to six very small. In addition on three to five there is a diamond-shaped yellow mark on the middle of the dorsum, that on the fifth segment being very small, almost obsolete. Segments eight to nine with yellow on the exfoliation on either side ten entirely black.

*Anal appendages*: upper pair about equal in length to segments nine to ten together, black shading to yellow distally. Seen in profile they run straight backwards, tapering quite suddenly near the apices where they are curved sharply downwards, ending in a fine point. Seen from above they are curved regularly inwards but do not meet at the apices.

The lower appendix is black, about half the length of the upper pair, and is cleft shallowly at about the middle of its length, to form a pair of diverging branches. Seen in profile it is directed at first rather downwards, and before the middle of its length is angled gently to slope upwards.

♀. Length of abdomen 32.5 mm. of hind-wing 28.5 mm.

In colour scarcely differs from the male except that the sides of the first and second segments of the abdomen are largely brownish-black, and segments eight, nine are

without any yellow. The colouring to the judge by the single pair available is also less vivid in the female than in the male.

Nodal indicator.

♂	9	—	14		14	—	10		♀	10	—	16		15	—	10
	10	—	11		10	—	10			10	—	11		10	—	10

Anal angle of male 4-celled. Anal loop indefinitely 2-celled.

Between *M1* + 3 and *M4* there are two cross-veins on the fore-wing one on the hind-wing.

On comparing this description with that given by de Selys for his *Onychogomphus circularis* it is quite evident that the two are almost identical save for size. *Circularis* has the abdomen, ♂ 41 mm., hind-wing 32 mm. ♀ 41 mm., 38 mm.

It is in fact very probable that this *minor* is only a local race of *circularis*. As the dimensions are so different I see no objection to giving the present form a name.

## LIBELLULIDAE.

### Corduliinae.

#### 86. *Hemicordulia asiatica* Selys.

- 1 ♂. Pahang: Kuala Teku, 500', Dec. 1921, H.M.P.  
 1 ♂. Pahang: Kuala Tahan, 300', Dec. 1921, H.M.P.  
 1 ♂. Pahang: Lubok Tamang, 3500', (immature)  
 March 24th, 1924, H.M.P.

The species ranges from Ceylon and S. India to Borneo.

#### 87. \* *Macromidia genialis* Laidlaw.

*Macromidia genialis*, Laidlaw, Malayan Branch  
 R. Asiatic Soc. 1923, pp. 231-232, Pl. V.

Known from a single male only, taken at about 1000 ft. on Gunong Tahan, by Mr. Chasen.

#### 88. *Epophthalmia australis* Hagen.

*Epophthalmia australis*, Ris, Ann. Soc. Entom.  
 Belg. LV, 1911, pp. 248-250, figs. 14-15-16.

- 1 ♂, 1 ♀. Selangor: Kuala Lumpur.  
 1 ♀. Perak: Taiping.

Ris has recorded this fine species from Kuala Kangsar.

89. \* *Macromia callisto* Laidlaw.

*Macromia gerstaeckeri*, Laidlaw, nec Krüger,  
Proc. Zool. Soc. London, 1902, pp. 76-78.

A pair of this species was taken by myself at Kuala Aring, Kelantan in Oct. 1899.

For this and the last species see "Some notes on Oriental Dragonflies: the genus *Macromia*." Laidlaw, Journ. Straits Branch R. As. Soc. LXXXV, 1922, pp. 218-228, figs. 1-7.

90. \* *Macromia westwoodi* Selys.

1 ♂. Perak: Maxwell's Hill, (Raffles Museum).

The type specimen, a female appears to have been lost. It was taken in Penang. The abdomen has segments 2-6 metallic green in colour.

91. \* *Macromia moorei fumata* Krüger.

*M. moorei malayana*, Laidlaw, Proc. Zool. Soc. London, 1928, pp. 133-134.

1 ♂. Pahang: Lubok Tamang, June 1923, F. N. Chasen.

92. (*Idionyx yolanda* Selys.)

[There are I believe at least two species of the genus found in the Peninsula. One of these is *yolanda* the type of the genus, (leaving out of account the question of nomenclature). The single specimen of this species, a female, was taken by Wallace in Singapore. The male referred to it by de Selys is not conspecific, but has been given distinct specific rank by Fraser as *I. selysi*.

Other specimens taken very rarely in the Peninsula indicate the occurrence of a second species, perhaps *montana* of Karsch. But the material is so scanty, and in such poor condition that determination must be doubtful].

See:—

Martin, Cat. Coll. Selys, *Corduliinae*.

Kruger, Stettin Entom. Zeit. 1899, pp. 326-335. Describes *I. dohrni* n. sp. from Sumatra.

Laidlaw, Proc. Zool. Soc. London, 1902, I, p. 78, Pl. V, fig. 4. (records a ♀ *I. dohrni* from Kuala Aring, Kelantan).

Ris. Zool. Mededeel. 'S Rijks Mus. Nat. Hist. Leiden X, 1927, pp. 35-36. Discusses *montana* and other species.

Fraser, Rec. Ind. Mus. XXVIII, 1925, pp. 195-207, Pl. VIII, IX, X. Revision of the genus.

1 ♂. Perak: Gunong Kledang, Nov. 1916, per J. C. Moulton,

(The damaged anal appendages agree with those figured by Martin for *montana*. Length of hind-wing 25 mm. Eleven antenodals and six postnodals on fore-wing).

1 ♂. Johore: Kota Tinggi, Aug. 1917, per J. C. Moulton.

(Imperfect, length of hind-wing 26 mm.

Antenodals thirteen, postnodals six on fore-wing. Anal appendages lost).

1 ♀. Perak: Jor Camp, 2000', Aug. 1922, E. Seimund.

(Imperfect, length of hind-wing 30 mm. Fifteen antenodals and seven postnodals on fore-wing).

These all appear to me to be conspecific.

### Libellulinae.

#### 93. \* *Tetrathemis irregularis hyalina* Kirby.

*T. irregularis hyalina*, Ris, Monogr. Libell. p. 47.

*T. hyalina*, Laidlaw, Proc. Zool. Soc. London, 1902, I, p. 70, fig. 10.

*T. sumatrana*, Krüger, Stettin Ent. Zeit. 63, p. 191, (1902)

My specimens were taken at Kuala Aring, Kelantan, in Sept. 1899. Ris (*loc. cit.*) records the species from Kuala Kangsar, Perak.

#### 94. \* *Tetrathemis platyptera* Selys.

*Tetrathemis platyptera*, Ris, Monograph, pp. 50-51, figs. 10-15.

*T. flava*, Krüger, Stettin Ent. Zeit. 63, p. 190, 1902.

*T. pulchra*, Laidlaw, Proc. Zool. Soc. London, 1902, I, p. 71, Pl. V, fig. 3.

This species was also taken by me in Kelantan near Kuala Aring, in Sept. 1899.

#### 95. *Orchithemis pulcherrima* Brauer.

1 ♂. Selangor: Kuala Lumpur, Aug. 1914, (red form).

1 ♂. (immature) Same locality, June 1921, H.M.P.

1 ♀. Selangor: Bukit Cherakah Forest Reserve, July 1921, H.M.P.

1 ♂. 2 ♀♀ Johore: Gunong Pulai, Aug. 1921, V. Knight (red form).

1 ♂. Singapore Is: Kranji, Jan. 1923, H. C. Abraham.

- 1 ♂. Singapore Is: Jurong, Aug. 1920, (brown form).  
 2 ♀ ♀. Same locality and date.  
 1 ♀. Singapore Is: Ulu Pandan, Aug. 1920.
96. \**Pornothemis serrata* Krüger.  
 1 ♂. Singapore: Pulau Ubin, F. N. Chasen, 25, Sept. 1921.
97. *Lyriothemis biappendiculata* (Selys).  
 1 ♂. Selangor: Ulu Gombak, July 1915.  
 3 ♂ ♂. Pahang: Kuala Tahan, March 1921, E. Seimund.
98. *Lyriothemis cleis* Brauer.  
 1 ♂. Perak: Batang Padang, Jor Camp, 2000', E. Seimund, Aug. 1922.  
 1 ♂. Same locality, 1800', June 1923, H.M.P.  
 1 ♀ ♀. Pahang: Kuala Tahan & Kuala Teku, E. Seimund, Feb-Mar. 1921.  
 1 ♀. Perak: Jor Camp, Sept. 1922, E. Seimund.
99. \**Lyriothemis magnificata* Selys.  
*Lyriothemis magnificata*, Ris. Cat. Coll. Selys, pp. 115-117, figs. 83-84.  
 Recorded from Kuala Kangsar, Perak. I have seen a single male from Peninsular Siam, the most northerly record for the species.
100. *Lathrecista asiatica* (Fabr.)  
 2 ♀ ♀. Selangor: Kuala Lumpur.  
 1 ♂. Jalor: Mabek, July 1901, Dr. N. Annandale.
101. \**Nesoxenia lineata* (Selys).  
*Agrionoptera malaccensis*, Kirby, Cat. Odonata, p. 31.  
 Laidlaw, Proc. Zool. Soc. London, 1902, I, p. 69.  
 Taken by Wallace in Malacca and Singapore.
102. *Agrionoptera insignis insignis* (Rambur).  
*A. insignis insignis*, Ris. Cat. Coll. Selys. pp. 137-138, fig. 99.  
 1 ♂. Malay Peninsula, East Coast, Pulau Perhentian, June 1926, C. Boden Kloss.
103. \**Agrionoptera sexlineata* Selys.  
 4 ♂ ♂, 3 ♀ ♀. Singapore. (sent to me by the late Major Moulton).

A very handsome species which is apparently common in the environs of Singapore.

104. *Cratilla metallica* (Brauer).

1 ♀. Tioman Island, E. Coast of Peninsula, June-July 1916, H. C. Robinson & C. Boden Kloss.

1 ♀. Selangor: Kuala Lumpur, June 1927, H.M.P.

1 ♂. Pahang: Kuala Teku, 550-700' F. N. Chasen, Dec. 1921.

I have seen also several specimens from Bukit Timah, Singapore.

105. \* *Cratilla lineata* (Brauer).

*Cratilla lineata*, Ris. Cat. Coll. Selys. pp. 153-154, figs. 110-111.

Recorded by Ris from Kuala Kangsar, Perak.

106. *Potamarcha obscura* (Ramb.).

2 ♂ ♂, 2 ♀ ♀. Singapore: Botanic Gardens, Feb.-Aug.-Dec. 1921-22. J. C. Moulton.

1 ♂. Singapore: Pulau Ubin, April 1921, F. N. Chasen.

1 ♂. Selangor: Kuala Lumpur, 6th mile, Pahang Road, Aug. 1924, H.M.P.

Common and widely-spread.

107. *Orthetrum sabina* (Drury).

1 ♂. Selangor: Kuala Lumpur, 6th mile, Pahang Road, Aug. 1924, H.M.P.

1 ♂, 1 ♀. Selangor: Kuala Lumpur, 10th mile, Rawang Road.

(The female had in its mandibles the remains of a butterfly, *Neptis hylas mamaja*, which it was devouring).

1 ♂, 1 ♀. Singapore: Botanic Gardens, March 1923, J. C. Moulton.

One of the commonest forms in all collections from the East.

108. *Orthetrum glaucum* (Brauer).

2 ♂ ♂. Selangor: Gombak Valley, Oct. 1921, May, H.M.P.

2 ♂ ♂. Selangor: Kuala Lumpur, Oct. 1921, H.M.P.

1 ♂. Selangor: Ampang Reservoir, July 1921.

1 ♀. Pahang: Kuala Tahan, 300', Nov. 1921, H.M.P.

A very common species.

Kirby's species *nicevillei* is synonymous.



109. *Orthetrum testaceum* (Burm.).

1 ♂. Singapore Is: Bukit Timah.

1 ♂ ♂. Singapore Is: Mandai, Jan. 1923, Hassan, per H.C.A.

1 ♂. Singapore: Kranji, H. C. Abraham.

2 ♂ ♂, 1 ♀. Singapore: Botanic Gardens, Jan.-Feb. 1923, J. C. Moulton.

3 ♂ ♂. Selangor: Kuala Lumpur, July-Oct. 1922, H.M.P.

1 ♀. Selangor, June 1921, H. C. Abraham.

2 ♀ ♀. Selangor: Cheras Road, Kuala Lumpur, June 1924, H.M.P.

110. *Orthetrum chrysis* (Selys).

1 ♂. Perak, F.M.S. (no other data).

1 ♂ ♂, 2 ♀ ♀. Singapore, March and August, 1921-1923, J. C. Moulton.

2 ♂ ♂. Singapore: Pulau Ubin, Jan.-Sept. 1923, F. N. Chasen.

Wallace collected this species in Singapore.

111. \* *Orthetrum pruinolum neglectum* (Ramb.).

Taken by Prof. R. Martin in Malacca (?), Sungei Ujong, and Pahang; and by myself at Kuala Aring, Kelantan, Sept. 1899.

112. *Orthetrum triangulare triangulare* (Selys).

*O. triangulare triangulare*, Ris, Cat. Coll. Selys, pp. 243-244.

*O. triangulare malaccense*, Forster, Ann. Mus. Hungar. 1903, p. 542.

Dr. Ris has a specimen taken by Prof. R. Martin in Selangor.

1 ♂. Perak: Batang Padang, Jor Camp, 1800', June 1923, H.M.P.

2 ♂ ♂. Pahang: Lubok Tamang 3500', June 1923, H.M.P.

1 ♂. Pahang: "Cameron's Highlands," Tanah Rata, 4000', June 1923, H.M.P.

1 ♂. Peninsular Siam: Jalor, Bukit Besar, 2500', Aug. 1901, Dr. N. Annandale.

113. *Orthetrum luzonicum* (Brauer).

1 ♂, 4 ♀ ♀. Selangor: Cheras Rd., 6¾ miles from Kuala Lumpur, April 1923, H.M.P.

Ranges from India to Java and the Philippine Islands. Closely allied to the African species (*chrysostigma*).

114. *Nannophya pygmaea* Rambur.

1 ♀. Singapore Is: Mandai, Jan. 1923, H. Abraham.

1 ♂, 1 ♀. Oct. 1922. 5 ♂ ♂. Apr. 1923. Selangor: Cheras Rd., 6¾ miles from Kuala Lumpur, H.M.P.

1 ♂, 1 ♀. Selangor: Kuala Lumpur, back water in Klang River, Aug. 1926, C. Dover.

Both Wallace and Ris collected this species in Singapore. It is the smallest, and one of the most beautiful of Oriental Libellulines.

115. *Brachygonia oculata* (Braue.).

*Brachygonia oculata*, Ris, Cat. Coll. Selys. Libell., pp. 347-348, figs. 196-197.

1 ♂. Selangor: Kuala Lumpur.

The British Museum has specimens from Malacca taken by Mr. Ridley, and there are specimens from Singapore in the Selysian collection taken by Wallace.

116. *Tyriobapta torrida* Kirby.

2 ♂ ♂. Selangor: Bukit Lajong & Bukit Cheraka, June 1921, H. C. Abraham.

1 ♂. Selangor: Ampang Road, Kuala Lumpur, June 1922, H.M.P.

1 ♂. (juv.) Peninsular Siam: Trang, Banchong, May 1924, I. H. N. Evans.

This is one of the most characteristic of Malayan species. It occurs also in Borneo and Sumatra.

117. \* *Brachydiplax farinosa* Kruger.

*Brachydiplax farinosa*, Ris. Cat. Coll. Selys, pp. 361-362, figs. 213-214.

*Brachydiplax pruinosa*, Laidlaw, Proc. Zool. Soc. London, 1902, I, p. 67.

Taken by me at Kuala Aring, Kelantan. The species appears to be fairly common in Burma and Peninsular Siam. Recorded by Ris (*loc. cit.*) from Kuala Kangsar, Perak.

Occurs also in Sumatra.

118. \* *Brachydiplax sobrina* (Ramb.).

1 ♂. Peninsular Siam: Jalor, Biserat, July 1901. Dr. N. Annandale.

Smaller and darker than the Indian form with six antenodal nerves only on the forewing.

See Ris, Cat. Coll. Selys, p. 1122.

119. *Brachydiplax chalybea* Brauer.

2 ♂ ♂. Singapore: Jurong, Aug. 1920, J. C. Moulton.

2 ♂ ♂. Malay Peninsula: Perak Mus. F.M.S.

120. *Raphismia bispina* (Hagen).

*Raphismia bispina*, Ris, Cat. Coll. Selys, pp. 369-370, figs. 219-221.

1 ♀. Pulau Tioman, E. Coast, Malay Peninsula, June 1926, C. Boden Kloss.

Ranges through Borneo as far East as Batchian.

121. *Diplacodes nebulosa* (Fabr.).

5 ♂ ♂, 1 ♀. Pahang: East Coast, Beserah, May-June 1926, H.M.P.

1 ♂. Selangor: Kuala Lumpur, Setapak pond, Aug. 1926, C. Dover.

Recorded by Ris from Singapore, where it was taken by him in April 1891. Ranges from Ceylon and India to Queensland.

122. *Diplacodes trivialis* (Ramb.).

2 ♂ ♂, 1 ♀. Patani, N. Annandale.

3 ♂ ♂. Singapore, J. C. Moulton.

1 ♂, 1 ♀. Selangor: Kuala Lumpur, March 1922, H.M.P.

1 ♂. Pahang: Lubok Tamang, 3500', "at light" June 1923, H.M.P.

Perhaps the commonest oriental Libellulid.

123. *Acisoma panorpoides* (Rambur).

1 ♂. Perak: Taiping.

1 ♂, 1 ♀. Pahang: East Coast, Beserah, June 1926, H.M.P.

1 ♀. Selangor: Kuala Lumpur, Setapak Pond, Sept. 1926, C. Dover.

A common and widely spread insect, which occurs in lowlying areas all over the Peninsula, and has been frequently taken in Singapore.

124. \* *Indothemis limbata limbata* (Selys).

*Indothemis limbata*, Ris, Cat. Coll. Selys, pp. 531-532, fig. 319.

There is a male of this species in the British Museum from Kuala Kangsar, Perak; and two males taken by Mr. Ridley in Singapore. The geographical race *sita* is from Ceylon.

125. *Brachythemis contaminata* (Fabr.).

2 ♂ ♂. Selangor: Kuala Lumpur, Setapak, C. Dover, July-Aug.

2 ♂ ♂. Malay Peninsula (no other data).

2 ♀ ♀. Peninsular Siam: Mabek and Biserat, Jalor, Dr. Annandale, 1901.

1 ♀. Peninsular Siam: Nakon Sri Tamarat, Khao Luang, April 1922, H.M.P.

Common on the lower reaches of the Kelantan and Trengganu rivers. I have also seen specimens from Rompibun in Lower Siam. Ranges from India to Sumatra and Java. Not recorded from Borneo or further East.

126. *Neurothemis tullia* (Drury).

4 ♂ ♂. Peninsular Siam: Nakon Sri Tamarat, Khao Ram, 300'–1500', Feb.–March 22, H.M.P.

1 ♂. Peninsular Siam: Patalung, Paknam Lampan, "at light," May 24, I. H. N. Evans.

1 ♀. "Malay Peninsula."

I found this species fairly common on the Kelantan River at Kota Bharu.

The Peninsular specimens all appear to be typical "*tullia*."

127. *Neurothemis fluctuans* (Fabr.)

1 ♂. Singapore: Mandai, 7th June, 1923, B. Abraham.

1 ♀. (andromorph) Pulau Ubin, April, F. N. Chasen.

4 ♂ ♂, 2 ♀ ♀. Selangor: Rawang Rd., Kuala Lumpur, Oct. 1924, H.M.P.

1 ♂, 3 ♀ ♀. Selangor: Cheras Rd., Kuala Lumpur, Aug. 1924, H.M.P.

An abundant and widely spread species.

128. \* *Neurothemis disparilis* Kirby.

Taken by Ridley in Singapore, and by myself at Kuala Aring Kelantan in October.

The species is known also from Borneo.

129. \* *Neurothemis terminata* Ris.

*Neurothemis stigmatizans*, Laidlaw (nec Fabr.), Proc. Zool. Soc. London, 1902, I, p. 66.

The degree of intensity of the wing colour varies according to the maturity of the individual. The species is not variable in the sense that different forms exist in the same locality.

130. *Neurothemis fulvia* Drury.

1 ♀. Selangor: Batu Caves, Kuala Lumpur, Dec. 1923, H.M.P.

1 ♂. Peninsular Siam: Nakon Sri Tamarat, Khao Ram, Tai Sai River, Feb. 1922, H.M.P.

1 ♀. Selangor: 3rd mile Bangsar Rd., Kuala Lumpur, Aug. 1924, H.M.P.

131. *Crocothemis servilia* (Drury).

1 ♂, 1 ♀. Selangor: near Kuala Lumpur, Sept.–Oct. 1924, H.M.P.

Recorded by Ris from Singapore. A common padi-field species.

132. \* *Rhodothemis rufa* (Ramb.).

1 ♂. Singapore, Aug. 1921, J. C. Moulton.

Widely spread over the Oriental Region.

133. *Pseudothemis jorina* Förster.

*Pseudothemis jorina*, Förster, Insektenborse, 1904, (p. 4 sep.).

Ris, Selysian Monograph, p. 72. (a possible race of *P. zonata* Selys).

2 ♂ ♂, 1 ♀. Selangor: Kuala Lumpur, F.M.S., Sept.—Oct. 1922, H.M.P.

With these specimens before me I feel justified in accepting Förster's determination of specific rank to this fine insect. They are all much smaller than *zonata*, according to Ris' account and differ further in having the apex of the wings entirely uncoloured. The basal markings are also much smaller in both sexes, the brown mark on the submedian space of the hind-wing scarcely extending beyond *Ac*, and the anal area being only lightly tinged with pale yellow as far as the level of the base of the triangle.

The species is very distinct in appearance from any other Malay Libelluline: the beautiful primrose yellow of the second, third and basal part of the fourth segments of the abdomen contrasting with the rich brown-black of the rest of the body.

No specimens have been recorded since the type from Jor on the Perak-Pahang boundary was described by Förster.

Length of hind-wing 32 mm. of abdomen 24–25 mm.

134. *Trithemis aurora* (Burm.).

1 ♂. Singapore: Jurong, J. C. Moulton, Aug. 1920.

1 ♀. Aug. 1920, 1, Dec. 1922, Singapore, J.C.M.

1 ♀. Perak: Sungei Siput, Kuala Dipang, June 1921.

3 ♂ ♂, 2 ♀ ♀. Selangor: Kuala Lumpur, Nov. 1921, H.M.P.

135. *Trithemis pallidinervis* (Kirby).

1 ♂. Perlis: Padang Besar, 300', 16.2.22. H.M.P.

1 ♀. Selangor: Setapak Pond, Kuala Lumpur, 14.8.26. C. Dover.

2 ♂ ♂. "Malay Peninsula."

- 1 ♀. Peninsular Siam: Nakon Sri Tamarat, Ban Lan Sah Kah, 8.3.22. H.M.P.

The species ranges from Ceylon and Peninsular India through Burma to the Malay Peninsula, but so far as I know does not reach Borneo or Sumatra.

136. \* *Trithemis festiva* (Ramb.).

- 1 ♂. Singapore, Aug. 1921, J. C. Moulton.

- 1 ♂. Singapore Id: Kranji, Jan. 1923, Hassan per H. C. Abraham.

Ranges from India to Sumatra and Borneo.

137. *Zygonyx iris malayana* Laidlaw. -

*Zygonidia malayana*, Laidlaw, Proc. Zool. Soc. London, 1902, I, pp. 73-75, fig. 11.

(See also Ris, Cat. Coll. Selys, pp. 820-823, and Fraser, Journ. Bombay, Nat. Hist. Soc. Nov. 1926).

- 2 ♂ ♂. Pahang: Kuala Teku, Feb.-Dec. 1921, 500', E. Seimund.

- 2 ♂ ♂. Pahang: Kuala Tahan, Feb. 1921, E. Seimund.

- 1 ♂. Perak.

- 1 ♂. Selangor: Gombak Valley, 16 mile, Jan. 1921.

- 1 ♂. Peninsular Siam: Nakon Sri Tamarat, Khao Ram, Feb. 1922, H.M.P.

- 1 ♀. Pahang: Sungei Tahan.

- 1 ♀. Selangor: near Kuala Lumpur, Ampang Res., July 1921, H.M.P. and E.S.

My specimens were taken at Kuala Aring, Kelantan in Sept. 1899.

Ris regards the various forms of *iris* which have been described from different parts of the Oriental Region as scarcely sufficiently distinct to deserve naming as sub-species. (Ris *loc. cit.*)

On the other hand Fraser has more recently, and with the opportunity of studying a long series of specimens, described several local races. I have not sufficient material at hand to form an opinion on the matter of any value. The Malayan material seems very much like a single male I have from Tonkin, and also very near Fraser's Burmese race *mildredae*. The abdomen is black except for the second segment and for a very fine, brownish carina on segments two to nine.

138. *Zygonyx ida* Selys.

*Neurocena ida*, Laidlaw, Proc. Zool. Soc. London, 1902, I, pp. 72-73, Pl. V, fig. 1.

*Zygonyx ida*, Ris. Cat. Coll. Selys, pp. 819-820, fig. 472-477.

1 ♂. Pahang: Kuala Teku, Feb. 1921, E. Seimund.

1 ♂. Selangor: Gombak Valley, Oct. 1921, H.M.P.

2 ♀ ♀. Perak: Batang Padang, Jor Camp, 1800',  
Aug. 1922, E. Seimund.

139. *Onychothemis testacea* Laidlaw.

*Onychothemis testacea*, Laidlaw, Proc. Zool. Soc.  
London, 1902, I, pp. 75-76.

*Onychothemis tonkinensis*, Martin, Mission  
Pavie, Nevropteres, 1904, pp. 5-6. (sep).

(See also Ris, Cat. Coll. Selys, Libellulidae, pp. 833-834.)

1 ♀. Pahang: Kuala Tahan, 300', Nov. 1921, H.M.P.

The male type was taken by me at Kuala Aring in  
Kelantan in Aug. 1899.

The name *testacea* has priority over *tonkinensis*. As  
Ris has pointed out (*loc. cit.*) there is no structural  
distinction between specimens from Tonkin and the  
Peninsula, and the colour differences are very slight. The  
Malayan race has a yellow spot on the dorsum of the eighth  
segment of the abdomen which is constantly absent in  
*tonkinensis*, whilst the latter has the lateral yellow spots  
on segments three to seven rather larger.

140. *Onychothemis culminicola* Förster.

*Onychothemis culminicola culminicola*, Ris, Cat.  
Coll. Selys, pp. 835-836.

1 ♂. Pahang: Kuala Teku.

141. *Zyxomma petiolatum* (Ramb.).

1 ♂. Malay Peninsula. (no other data).

Widely distributed but not abundant.

Taken by Ridley in Singapore. Recorded by Ris from  
Kuala Kangsar, Perak.

142. *Pantala flavescens* (Fabr.).

1 ♂. Selangor: Kuala Lumpur, Sept. 1922, H.M.P.

1 ♂. Singapore Id: Mandai, H. C. Abraham, Apr.  
1922.

1 ♂. Pulau Angsa: West Coast, Malay Peninsula, at  
light, E. Seimund, Oct. 1926.

1 ♀. Selangor: Kuala Lumpur, at light, Aug. 1923,  
H.M.P.

A cosmopolitan species.

143. *Tholymis tillarga* (Fabr.).

1 ♂, 2 ♀ ♀. Singapore, Feb.-Dec. 1922.

1 ♂. Singapore: Mandai, "At light," 9, Jan. 1923,  
B. Abraham.

1 ♂. Negri Sembilan: Kuala Pilah, Dec. 1923,  
H.M.P.

144. \* *Camacinia gigantea* (Brauer).

*Camacinia gigantea*, Ris, Cat. Coll. Selys, pp. 925-927, fig. 535-537.

Apparently fairly abundant in suitable localities. Taken by myself at Kuala Aring, Kelantan in Sept. 1899.

145. \* *Camacinia harterti* Karsch.

*Camacinia harterti*, Ris, Cat. Coll. Selys, pp. 928-929, figs. 538-539.

Prof. Rudolph Martin took a female of this fine species in Selangor. The specimen is in Ris' collection.

146. *Rhyothemis phyllis phyllis* (Sulzer).

*Rhyothemis phyllis phyllis*, Ris, Cat. Coll. Selys, pp. 938-940.

1 ♂, 2 ♀ ♀. Selangor: Cheras Road, Kuala Lumpur, April-Sept. H.M.P.

1 ♂, 2 ♀ ♀. Singapore Gardens, Dec. 1922.

1 ♂. Selangor: Kuala Lumpur, 9th mile Kepong, Sept. 1924, H.M.P.

Found in suitable localities all over the Peninsula.

Ranges from Rangoon to Borneo, Java and Sumatra.

147. *Rhyothemis aterrima* Selys.

*Rhyothemis aterrima*, Ris, Cat. Coll. Selys, p. 953.

1 ♀. Selangor: Klang Gates, Kuala Lumpur, Aug. 1923, H.M.P.

Recorded from Borneo and Sumatra.

148. *Rhyothemis obsolescens* Kirby.

*Rhyothemis obsolescens*, Ris, Cat. Coll. Selys, pp. 958-959, TF. VII. (as *vidua*).

1 ♂. Selangor: Kuala Lumpur, July 1922, H.M.P.

1 ♂. Selangor: Kuala Lumpur, Cheras Road, April 1923, H.M.P.

1 ♀. Singapore: Jurong, Aug. 1920.

Wallace collected this species in Singapore.

149. *Rhyothemis plutonia* Selys.

*Rhyothemis plutonia*, Ris, Cat. Coll. Selys, p. 956.

1 ♀. Pahang: Kuala Tahan, March 1921, E. Seimund.

Recorded by Ris from Kuala Kangsar, Perak.

150. \* *Rhyothemis triangularis* Kirby.

*Rhyothemis triangularis*, Ris, Cat. Coll. Selys, pp. 962-963.

Ris records the species from Kuala Kangsar, Perak.



151. \* *Hydrobasileus croceus* (Brauer).

*Hydrobasileus croceus*, Ris, Cat. Coll. Selys, pp. 969-970, fig. 562.

Recorded by Karsch for Penang (Karsch, Berlin, ent. Ztschr., 33, p. 351, 1890).

Probably not uncommon.

152. \* *Tramea limbata* Desjardins.

1 ♂. Cape Patani, Oct. 1901, Dr. N. Annandale.

The specimen which belongs to the Malayan form of this wide-spread insect, has the colouring of the base of the hind-wing much restricted. It may be taken as representing the form *euryale* Selys, or D2 of Ris' Monograph.

The species doubtless occurs in suitable spots all round the coast of the Peninsula.

153. \* *Urothemis abbotti* Laidlaw.

*Urothemis abbotti*, Laidlaw, Proc. U.S. Nat. Mus. Vol. 70, Art. 17, pp. 1-3, pl. 1.

Described from specimens from Trang, Peninsular Siam. Occurs also in Singapore: there is an imperfect specimen in the British Museum sent there from by the late Dr. Moulton.

154. \* *Urothemis signata* (Ramb.) race *insignata* (Selys).

*Urothemis signata insignata*, Ris, Cat. Coll. Selys, pp. 1024-1025.

Ris has specimens in his collection from Kuala Kangsar, Perak.

155. *Aethriamanta brevipennis brevipennis* (Ramb.).

1 ♂. (adult) 1 ♀. (immature). Patani. Collected by Dr. Annandale in 1902.

The subspecies ranges from Ceylon and India to the Peninsula, other races are found in Celebes, the Moluccas, and in Northern Australia.

156. *Aethriamanta gracilis* (Brauer).

*Aethriamanta gracilis*, Ris, Cat. Coll. Selys, pp. 1032-1033, figs. 597-598.

There is a specimen of this species in the British Museum from Selangor, taken by Dr. Ridley.

It was recorded by me under the name *Brachydiplax melaenops* Selys in 1902. This name is a synonym.

157. \* **Macrodiplax cora** (Brauer).

*Macrodiplax vittata*, Laidlaw, Proc. Zool. Soc. London, 1902, I, p. 67.

The locality given by me for this species—Kuala Aring—is unlikely; there has probably been some confusion of the labels. The species is one which is usually found near the coast, and it seems likely that it breeds in brackish water. (See Ris, Cat. Coll. Selys, pp. 1036-1038).

**SPECIES DELENDAE.**

*Macromia gerstaeckeri* Krüger.

Should be *M. callisto* Laidlaw. This and the three following are from my first list (1902).

*Amphiaeschna ampla* (Ramb.).

Should be *I. grubaueri*.

*Jagoria poeciloptera* Karsch.

Should be *J. modigliani* Selys.

Karsch's species occurs in the Philippine Islands.

*Gynacantha rosenbergi* Brauer.

A mistake for *G. basigutta*. *Rosenbergi* is a New Guinea species.

**DOUBTFUL RECORDS.**

*Vestalis lugens* Alb.

*Pseudophaea aspasia*.

Both these species are given by Förster in the Fasc. Malay., as from Jor on the Pahang-Perak boundary. I think there must be a mistake here. Förster had a number of specimens from Sumatra and I suggest that accidentally there was some confusion in the labelling or arranging of these specimens. It is of course not by any means impossible that they should occur in the Peninsula, but no other collector has found them, and they are both conspicuous species, and locally not uncommon.

**ADDENDUM.**

This account was completed in the autumn of 1929. Since then I have seen specimens of *Vestalis gracilis* (Ramb.), an Indo-Burmese species, which were taken on Kedah Peak at 3,000 ft. and a new species of *Leptogomphus* from Jitra in the lowlands of Kedah. In addition a distinct geographical race of *Devadatta argyroides* (Selys), from Aor Island off the east coast of Johore, is worth remark.

Mr. M. A. Lieftinck, working in Java, has quite lately noted the occurrence of *Agriocnemis nana* in Perak and gives some interesting comments (Lieftinck, Contributions to the Dragonfly Fauna of the Dutch East Indies, II, Treubia, XII, 1930, pp. 135-166).

The same author has published a valuable account of the species of *Macromia* from Malaysia, etc. (Lieftinck, A Revision of the known Malaysian Dragonflies of the genus *Macromia* Rambur. Tijds. v. Entomol., LXXII, 1929, pp. 59-108).

The late Dr. Ris in two contributions to our knowledge of the fauna of the Orient has given strong reasons for retaining the name *Calopteryx* Selys, in preference to *Agrion* Kirby. He has also pointed out that the generic name *Euphaea* is not preoccupied by *Euphaeus* Risso, and therefore stands. Further he has figured and discussed the species *Archibasis melanocyana* Selys, and comments on *Euphaea impar* Selys, which he regards as specifically distinct from *E. inaequipar* Selys.

(Ris, F. Vier neue Calopterygiden (Odonaten) von den Philippinen und Palawan. Mitt. Müncher Entomol. Gesell., XX, 1930, pp. 71-92, Taf. iv-vi.

Idem. Drei notisen uber Ostasiatische Agrioniden (Odonaten). Arkiv. f. Zool., K. Svenska Vetenskapsakad., Bd. 21A, No. 31, pp. 1-32).

#### IV. LITERATURE.

The following is a list of faunistic papers dealing with the Peninsula and with lands immediately related. It is not intended as a complete references list.

For references previous to 1890 Kirby's Catalogue of *Neuroptera Odonata* may be consulted.

For references to the *Libellulinae* Ris' Catalogue "Collections Zool. Bar. Edm. de Selys-Longchamps. Fasc. 9-16 Libellulinen 1909-1919" is quoted in the text as Ris, Cat. Coll. Selys.

Other references are given in the text where necessary.

#### Malay Peninsula.

- 1902. Laidlaw, F.F., On a collection of dragonflies made by members of the Skeat expedition in the Malay Peninsula in 1899-1900. Proc. Zool. Soc. London, 1902, I, p. 63-92, Pl. V, VI.
- 1903. Laidlaw, F.F., Report on the dragonflies Pt. I Fasciculi Malayenses. Zool. Part I, 1903, pp. 189-200.
- 1907. Laidlaw, F.F., and Förster, F.,—Report on the dragonflies II The Legions Platycnemis and Protoneura.—Fasciculi Malayenses. Zool. Pt. IV, 1907, pp. 1-15. (separate).

#### Borneo.

- 1911. Ris, F., Libellen von Sintang, Borneo gesammelt von Dr. L. Martin—Ann. Soc. Ent. Belg. 55 p. 231-255.—1911.

1920. Laidlaw, F.F., Contributions to a study of the Dragonfly fauna of Borneo. Pt. IV. A list of species known to occur in the Island. Proc. Zool. Soc. London, 1920, pp. 311-342.

### Sumatra.

1881. Albarda, Herman, in Veth's Midden Sumatra. Natur. Hist. Vijfde af. Neuroptera. Systematische lijst, met beschrijving der nieuwe of weinig bekende soorten, 20 pg. 8 tab. (p. 1-12 tab. 1-3 Odonata), 1881.
1889. Selys-Longchamps, Edm. de, Odonates de Sumatra comprenant les especes recueillies a Pulo Nias par M. le Dr. E. Modigliani—Ann. Mus. Civ. Genova 27, pp. 444-484.—1889.
1891. Karsch, F., Sumatranische Odonaten, gesammelt von Herrn Hofrath Dr. med. L. Martin in Bindjei (Deli)—Ent. Nachr. 17, pp. 241-247.
1898. Krüger, L., Die Odonaten von Sumatra, I. Theil Familie Agrioniden—Stett. Ent. Ztg. 59, p. 64-139.  
 ————— II Theil. Familie Aeschniden—ibid. 59, p. 267-331.
1899. ————— III Theil. a. Familie Libelluliden—ibid. 60, p. 321-338.
1902. ————— III Theil. b. Familie Libelluliden—ibid. 63, p. 58-193.
1925. Champion, H., Odonata collected in Korinchi, West Sumatra by H. C. Robinson and C. Boden Kloss.—Journ. F.M.S. Mus. VIII, Part III, pp. 161-165.
1927. Ris, F., Odonaten von Sumatra. Gesammelt von Edward Jacobson.—Zool. Mededeelingen 'S Rijks Museum van Nat. Hist. Leiden, Deel. X, af. 1 pp. 1-49.

### Java.

1912. Ris, F., Über Odonaten von Java und Krakatau gesammelt von Edward Jacobson—Tijdschr. v. Entom. 55, pp. 157-183, Tab. 6-8.
1926. Fraser, F.C. Notes on a Collection of Dragonflies (order Odonata) from the Dutch East Indies and descriptions of four new species from the neighbouring Continent—Treubia VIII, pp. 467-494.

### Simalur and Mentawi Islands etc., West Coast of Sumatra.

1915. Ris, F., Fauna Simalurensis. Odonata—Tijdschr. v. Entom. 88, p. 5-21.
1926. Laidlaw, F.F., Spolia Mentawiensia: Dragonflies (Odonata) with an introduction by C. Boden Kloss.—Journ. Malayan Branch R. Asiat. Soc. 4, p. 214-233.

## XII. A REVISED LIST OF THE DRAGONFLIES (ODONATA) OF BORNEO.

Based on material from the collections of the Federated Malay States and Sarawak Museums; with descriptions of new species.

*By* F. F. LAIDLAW.

- I. Preface.
- II. Introduction.
- III. Systematic.
- IV. List of species.

### I. PREFACE.

In 1927 I visited British North Borneo accompanied by Mr. H. M. Pendlebury, Entomologist of the Federated Malay States Museums, and Mr. F. N. Chasen, Curator of the Raffles Museum, Straits Settlements. We spent nearly four months in the State (June—September) and amongst the large series of insects obtained, for which Mr. Pendlebury was principally responsible locally, were the Odonata which are listed in the present paper. These, together with such Bornean Material as was in the Raffles Museum, are now in the Selangor Museum, F. M. S.

In determining the 1927 collection Mr. F. F. Laidlaw has taken the opportunity to bring up to date his 1920 list of species of Dragon-flies known to occur in Borneo: and I am very glad to be able to print his new account side by side with his "Dragon-flies of the Malay Peninsula" (antea pp. 175–233) as two such articles by the same author and prepared practically together afford material better than usual for a comparison of the faunas of these two important provinces of Malaysia.\*

The localities whence the recent material came are:—

1. **Samawang.** About twenty-five miles West by North of Sandakan: swampy coastal country and small forested hills penetrating into the nipah palm area which fills the estuary of the Samawang River.

2. **Bettotan.** About twenty-two miles West by South of Sandakan up a river running into the head of Sandakan Bay: a cleared, partially cleared, and forested expanse of undulating low-country.

3. **Kudat.** On the North-Western point of the island: cultivated, or grass and scrub covered country with a few small patches of forest.

C. Boden Kloss, Director of Museums, S.S. and F.M.S.

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\* Further material from North Borneo, collected on and about Mt. Kinabalu in 1929 by Mr. Pendlebury is now being studied by Dr. Laidlaw: his report on it will appear later in this Journal, C.B.K.

## II. INTRODUCTION.

Since my 'List of species of Dragon-flies known to occur in the Island' was published in 1920 (Proc. Zool. Soc. London, 1920, pp. 311—342) several new species have been taken in Borneo, and I have found a certain number of errors in the list.

These additions and corrections will be found incorporated in the present list, and I am much obliged to Mr. Boden Kloss for the opportunity of giving them. There remain still a few species whose status is doubtful, but not enough to mar the list. These are left unnumbered, in most cases their determination remains uncertain.

The fauna of Borneo shows less of a mixed character than that of any other part of the Oriental Region. Of the 180 (circ.) species recorded about 72.5 per cent are purely Malaysian (*i.e.*, confined to the Malay Peninsula, Borneo, Palawan, Sumatra, Java, Bali and their satellite islands), 25 per cent. of the species are confined to Borneo itself; whilst of the genera 19.5 per cent. are confined to Malaysia.

The Sumatran list and that of the Malay Peninsula do not show quite such a marked degree of specialization though they do not fall far short of it.

I am indebted to Mr. M. A. Lieftinck (Zoological Museum, Buitenzorg) who has very kindly allowed me to incorporate records from the Leiden and Hamburg Museums.

Species of which I have not examined Bornean examples are marked in the list with an asterisk. (\*)

## III. SYSTEMATIC.

- No. 122. *Rhinocypha spinifer* Martin, sp. n.  
No. 124. „ *aurofulgens* Martin, sp. n.  
No. 131. *Micromerus phaethon* Laidlaw, sp. n.  
No. 165. *Pericnemis triangularis* Laidlaw, sp. n.  
No. 174. *Agriocnemis alcyone* Laidlaw, sp. n.

## IV. LIST OF SPECIES.

### ANISOPTERA.

#### Family CORDULEGASTRIDAE.

1. *Orogomphus dyak* Laidlaw.
2. *Orogomphus splendidus* Selys.  
Until the male is discovered this determination must be regarded as a little doubtful.

#### Family AESCHNIDAE.

3. \* *Linaeschna polli* Martin.

4. **Jagoria modigliani** (Selys).\* **Jagoria amata** Förster.

*Jagoria amata* Förster, Insekten-Börse 1903, XX  
sep. pp. 1—2.

\* **Jagoria buhri** Förster (*loc. cit.*).

I am not sure of the status of this and of the last  
species.

5. **Indaeschna grubaueri** (Förster).

*Amphiaeschna perampla* Martin is I believe an  
absolute synonym.

1 ♂ Bettotan, July, 27.

6. **Heliaeschna crassa** Krüger.

1 ♂ 1 ♀ Bettotan, 11th, 24th August, 27.

Readily distinguished by the rich brown colouring  
of the wings in both sexes.

7. **Heliaeschna weelei** Martin.

1 ♂, Samawang, 8th July, 27. "evening."

Ris has recorded this species from the Ophir district of  
Sumatra, and has pointed out that the type described by  
Martin as from Liberia must in all probability have had a  
wrong locality ascribed to it.

(Ris, Zool. Meded. 's Rijks Mus. Nat. Hist. Leiden, X, i,  
1927, pp. 31—33, fig. 22—28).

8. \* **Heliaeschna uninervulata** Martin.

Type from Borneo, occurs also in Burma.

9. **Heliaeschna idae** (Brauer).

1 ♀ (No precise locality) J. C. Moulton.

10. \* **Heliaeschna simplicia** (Karsch).11. **Tetracanthagyna plagiata** Waterhouse.12. **Tetracanthagyna degorsi** Martin.13. **Tetracanthagyna waterhousei** Mclach.14. **Tetracanthagyna brunnea** Mclach.15. **Gynacantha bayadera** Selys.16. **Gynacantha basiguttata** Selys.17. **Gynacantha dohrni** Krüger.18. **Gynacantha demeter** Ris.19. **Gynacantha maclachlani** Krüger.20. **Gynacantha subinterrupta** Ramb.

This includes specimens hitherto incorrectly identified  
as *G. hyalina* Selys.

21. **Anax guttatus** Burm.

1 ♀ Bettotan 18th August, 27.

22. \* **Anaciaeschna jaspidea** Burm.

## Family GOMPHIDAE.

23. *Sieboldius japonicus* Selys.

(1 ♂ Br. N. Borneo, Mt. Marapok, Dent Province, Mus. Leiden.)

24. *Ictinus acutus* Laidlaw.25. *Ictinus melaenops* Selys.26. \* *Ictinus decoratus* Selys.27. *Gomphidia maclachlani* Selys.

1 ♀ Bettotan, 31st July, 27.

28. \* *Gomphidia karschi* Selys.29. \* *Gomphidia caesarea* Lieftinck.

(Western Central Borneo, Lebang Hara, Winkler, Mus. Hamburg.)

30. \* *Macrogomphus albardae* Selys.31. *Macrogomphus decemlineatus* Selys.32. *Macrogomphus quadratus* Selys.33. *Microgomphus chelifer* Selys.

1 ♂ Bettotan, 22nd July, 27.

34. \* *Heliogomphus blandulus* Lieftinck

(Western Central Borneo, Bika River. Winkler. Mus. Hamburg.)

35. *Leptogomphus williamsoni* Laidlaw.

Known only from the type male. Probably belongs to a distinct section of the genus.

36. *Leptogomphus lansbergei* Selys *assimilis* Kruger.

1 ♂, Bettotan 4th August, 27. I have compared this specimen with examples from Java kindly given me by Mr. Lieftinck.

\* [*Leptogomphus semperi* Selys.]

Originally described from Mindanao, I venture to doubt whether this species really occurs in Borneo. Martin gives Borneo, Tonkin, and the Philippine Islands as its habitat, and Williamson probably following Martin does the same. But very few *Gomphidae* have so wide a distribution in the East. I suggest that the specimens are really rather *lansbergei*.

37. *Burmagomphus insularis* Laidlaw.

Quite distinct from the Burmese *vermicularis* of Martin.

38. *Megalogomphus icterops* Martin *borneensis* Laidlaw.39. *Megalogomphus sumatranus* Krüger.



## Family LIBELLULIDAE.

## Corduliinae.

40. *Metaphya micans* Laidlaw.
41. *Macromidia fulva* Laidlaw.
42. *Macromia euterpe* Laidlaw.
43. *Macromia cydippe* Laidlaw.
44. *Macromia cincta* Ramb. (= *M. borneensis* Krüger).
45. *Macromia corycia* Laidlaw.
46. *Epophthalmia vittigera* Ramb.

Mr. Lieftinck has examined most of my material of *Macromia* and *Epophthalmia*, as well as many specimens from his own collection and that of the Leiden and Hamburg Museums, and the material in the Selysian collection. He tells me (*in litt.*) that *Macromia gerstaeckeri* Krüger does not occur in Borneo, that Krüger's species *borneensis* is certainly synonymous with *M. cincta* Ramb., and that all specimens of *Epophthalmia* that he has seen from the island are to be referred to *vittigera*. *E. australis* must therefore be deleted from the list.

47. *Idionyx dohrni* Krüger *borneensis* Laidlaw.
48. *Hemicordulia asiatica* Selys.

The specimens belonging to *Hemicordulia*, from Borneo should be referred to this species and not to *assimilis*.

## Libellulinae.

49. *Tetrathemis irregularis* Brauer *hyalina* Kirby.  
5 ♂♂ 1 ♀. Bettotan 23rd July, 24th August, 27.
50. *Tetrathemis flavescens* Kirby.
51. *Oda dohrni* (Krüger).
52. *Hylaeothemis clementia* Ris.
53. *Pornothemis serrata* Krüger.  
1 ♂ Bettotan 31st July, 27.
54. *Orchithemis xanthosoma* Laidlaw.
55. *Orchithemis pulcherrima* Brauer.  
1 ♀ Bettotan 23rd August, 27.
56. \* *Orchithemis pruinans* Brauer.
57. *Lyriothemis biappendiculata* (Selys).  
1 ♂ Bettotan 26th July, 27.
58. *Lyriothemis cleis* Brauer.  
2 ♂♂ Samawang 14th July, 27 "Jungle"  
2 ♂♂ 1 ♀ Bettotan 26th July—30th August, 27.  
1 ♂ Kudat, 9th September, 27.  
(Poetoes Sibau, Kapoeas River, ii 1925, Mus. Hamburg.)
- 58bis. *Dyristhemis magnificata* Selys. 1 ♂ Kina Balu.

59. *Nesoxenia lineata* (Selys).  
60. *Lathrecista asiatica* (Fabr.).  
5 ♂ ♂ 3 ♀ ♀ Kudat 11—12 September, 27.  
61. *Agrionoptera insignis* (Ramb.) *insignis* (Ramb.).  
3 ♂ ♂ 1 ♀ Bettotan 5—21 August, 27.  
1 ♂ 1 ♀ Kudat 6th September, 27.  
62. *Agrionoptera sexlineata* Selys.  
63. *Cratilla lineata* (Brauer).  
7 ♂ ♂ Bettotan, 22nd July—25th August, 27.  
64. *Cratilla metallica* (Brauer).  
2 ♂ ♂ Bettotan 25—30 July, 27.  
1 ♂ Limbang, Sarawak, Jan. 1915. H.W. Smith.  
1 ♀ Kudat 14th September, 27.  
(Western Central Borneo, Lebang Hara, Jan. 1925,  
H. Winkler, Mus. Hamburg).  
65. *Orthetrum pruinatum* (Selys).  
2 ♂ ♂ Gunong Tamabo 15th November, 20 (J. C.  
Moulton.)  
66. *Orthetrum testaceum* (Burm.).  
67. *Orthetrum chrysis* (Selys).  
68. *Orthetrum glaucum* (Brauer).  
69. *Orthetrum sabina* (Drury).  
70. *Potamarcha obscura* (Ramb.).  
71. *Nannophya pygmaea* Ramb.  
72. *Brachygonia oculata* (Brauer).  
73. *Brachygonia ophelia* Ris.  
74. *Tyriobapta torrida* Kirby.  
3 ♂ ♂ 23rd July, 27.  
2 ♂ ♂ 7—23 August, 27. All from Bettotan.  
3 ♀ ♀ 3—5 August, 27.  
75. *Tyriobapta kükenthali* Karsch.  
75bis. *Tyriobapta laidlawi* Ris.  
76. *Brachydiplax chalybea* Brauer *chalybea* Brauer.  
2 ♂ ♂ Kudat 1—6 September, 27.  
2 ♂ ♂ Labuan 23rd Sept. 27.  
(Doerian Segatang, ii 1925, Winkler, Mus. H'burg.)  
77. *Raphismia bispina* (Hagen).  
5 ♂ ♂ 13 ♀ ♀ Kudat, 3—17 September, 27.  
2 ♀ ♀ No locality or date.  
78. *Raphismia inermis* Ris.  
79. *Diplacodes trivialis* (Ramb.)  
1 ♀ Labuan, 23rd September, 27.  
80. *Crocothemis servilia* (Dru.).  
81. *Neurothemis disparilis* Kirby.

82. *Neurothemis fluctuans* (Fabr.).

83. *Neurothemis terminata* Ris.

7 ♂♂ 5 ♀♀ (heterochrome) Kudat, Sept., 27.  
1 ♂ 1 ♀ Bettotan, July, 27. (female heterochrome.)

A short series from Mangalum Id. contained only isochrome females. The males from this islet have the wing-coloration very extensive. This appears to be the case also with specimens from Lebang Hara in the Hamburg Museum dated Jan., 1928 of which Lieftinck remarks (*in litt.*):—

"*Neurothemis terminata* Ris *forma*." "Very peculiar form. Wing colour very dark brown, much darker than in examples from Java. Only the extreme tip of the wing, distal to pterostigma, hyaline."

84. *Rhodothemis rufa* (Ramb.).

85. *Pseudagrionoptera diotima* Ris.

86. *Trithemis aurora* (Burm.).

87. *Trithemis festiva* (Ramb.).

88. *Zygonyx iris* Selys.

89. *Zygonyx ida* Selys.

1 ♂ Ulu Akar 16th Sept., 14. Overlooked in the previous list.

90. *Onychothemis culminicola* Förster *culminicola* Förster.

91. *Onychothemis culminicola* Förster *celebensis* Ris.

(I believe these two will prove to be distinct species.)

92. *Zyxomma petiolatum* (Ramb.).

2 ♂♂ 1 ♀ Bettotan, 11 August, 27 "evening flying."

1 ♀ Kudat 14 Sept. 27.

93. *Zyxomma obtusum* Selys.

1 ♂ Bettotan, 8th August, 27.

94. *Rhyothemis phyllis* (Sulzer) *phyllis* Sulzer.

2 ♀♀ Kudat, 4—6 Sept., 27.

95. *Rhyothemis pygmaea* (Brauer).

96. *Rhyothemis aterrima* Selys.

97. *Rhyothemis obsolescens* Kirby.

98. *Rhyothemis triangularis* Kirby.

99. *Hydrobasileus croceus* (Brauer).

100. \**Camacinia harterti* Karsch.

101. *Camacinia gigantea* (Brauer).  
Mangalum Id.

102. *Tramea limbata* Desjardins.  
 103. *Pantala flavescens* (Fabr.).  
     1 ♀ Kudat, 13th September, 27.  
     1 ♀ Labuan 23rd September, 27.  
 104. *Tholymis tillarga* (Fabr.).  
     1 ♂ Kudat, 13th September, 27.  
 105. \**Urothemis signata* (Ramb.) *insignata* (Selys).  
 106. \**Aethriamanta gracilis* (Brauer).

## ZYGOPTERA.

## Family AGRIIDAE.

107. *Neurobasis chinensis* (Linn.).  
 108. *Matronoides cyaneipennis* Förster.  
 109. *Vestalis amoena* Selys.  
     5 ♂ ♂ 7 ♀ ♀ Bettotan 25th July—8th Aug., 27.  
 110. *Vestalis beryllae* Laidlaw.

## Family EPALLAGIDAE.

111. *Euphaea tricolor* (Selys.)  
 112. *Euphaea subcostalis* (Selys.)  
 113. *Euphaea subnodalis* Laidlaw.  
 114. *Euphaea basalis* Laidlaw.  
 115. *Euphaea inaequipar* Selys.  
     Regarded by Dr. Ris as quite distinct from *impar*  
     of the Malay Peninsula.  
 116. *Dysphaea limbata* Selys.  
     (West Central Borneo, Lebang Hara, XII: 24.2.25  
     Winkler. Mus. Hamburg).  
 117. *Dysphaea lugens* Selys.  
     (West Central Borneo, Kapoeas River, II. 25 Wink-  
     ler. Mus. Hamburg.)  
 118. *Devadatta argyroides* Selys.

## Family LIBELLAGIDAE.

119. *Rhynoneura villosipes* Laidlaw.  
 120. *Rhinocypha karschi* Krüger.  
     (I believe Martin's species *Micromerus rubropictus*  
     is synonymous.)  
 121. *Rhinocypha moultoni* Laidlaw.  
 122. *Rhinocypha spinifer* Martin (MSS.) sp. n.  
     2 ♂ ♂ (both in poor condition) Limbang 15.9.09.  
     J. C. Moulton. One of these specimens was submittd to  
     R. Martin who returned it to me labelled "*Rhinocypha*  
     *spinifer* sp. inedit, plus petit que mon type."

As the species has remained unnamed for nearly 20 years and as there seems no likelihood of its immediate publication I think it well to describe it here, using Martin's manuscript name.

Length of abdomen 18 mm. of hind-wing 22 mm. Wings uncoloured, save that the extreme apex of the hind-wings is very narrowly outlined in smoky black beyond the pterostigma. This latter is black.

*Head*: upper surfaces black, except a transverse yellow-orange line on the upper lip, the bases of the mandibles, and a band of the colour along the genae. No markings can be detected on the vertex.

*Prothorax*: black, in the less mature specimen the central part of the dorsum appears paler, and in the living specimen this area may be coloured.

*Synthorax*: black with a very narrow brick-red humeral stripe, incomplete above, and almost obsolete in the more mature specimen. Above and to the outer side of this is a fine line of the same colour, extending downwards from the alar sinus for about a third of the length of the dorsum.

On either side is a yellow band, which is continuous posteriorly with a yellow mark on the side of the first segment of the abdomen. Ventral surfaces black.

*Legs*: entirely black.

*Abdomen*: black, marked with yellow and brick-red as follows. On the dorsum of segments 3-8 is a large basal spot of brick-red, occupying about the anterior two-thirds of the segment, except on 3 where it extends only about half the length of the segment. On the more anterior segments this spot is very distinctly bilobed posteriorly, in the case of segment 3 it is practically divided into a distinct pair of spots. On the more posterior segments the margin of the spot becomes progressively less lobed, so that on segments 7-8 it is undivided.

On 9 there is a subcentral oval spot of the same colour on the dorsum.

In addition on the sides of all the segments 1-9 basally and apically. The abdomen is relatively slender.

The more adult specimen has the markings on the dorsum of segments 3-5 of the abdomen much restricted.

123. *Rhinocypha cucullata* Selys.

124. *Rhinocypha aurofulgens* Martin. (MSS.) sp. n.

As was the case with *spinifer*, specimens of this species were submitted to M. Martin in 1909 and returned by him with the note "*R. aurofulgens* sp. inedit." I have before me 3 ♂♂ 1 ♀ from Lio Matu, received from the late Dr. J. C. Moulton.

♂ Length of hind-wing 24 mm. of abdomen 20 mm. Wings with a uniform brownish-yellow tinge. On the forewings the apical part from the pterostigma outwards (about 5 mm.) is abruptly opaque and richly coloured with purple-

black, except the row of cells immediately below the pterostigma. The hindwings have a similar slightly more extensive apical mark (about 6 mm.) its inner margin rather crescentic and sloping rather inwards towards the hind margin of the wing, whilst that on the forewing has its inner margin almost at right angles to the long axis of the wing.

On the under surface of both wings this opaque mark has a very beautiful coppery reflex, recalling the colours seen on the wings of *fenestrella* and *quadrifasciata*, whilst in *cucullata* another Bornean species probably allied to *aurofulgens* the reflex is more definitely blue.

*Head*: black, the upper lip and genae blue. On the vertex there are a pair of fine yellow spots behind the ocelli, and in addition a minute pair of yellow, postocular spots, and between them a larger transversely oval spot of the same colour.

*Prothorax*: black, its posterior margin finely lined with yellow, and a large yellow spot on either side of the middle lobe.

*Synthorax*: black, with a pair of narrow humeral stripes of an orange yellow colour, narrowing to a point at their upper ends, and extending rather more than half-way up the dorsum. Above these on either side, and just lateral to the humeral suture is a fine yellow line, whilst the whole of the lower part of the side of the synthorax is occupied by a broad orange-yellow band. There is also a small yellow spot between the base of the fore and hind wing on either side. Ventral surface black. (In the living insect it is possible that these markings may have a blue colour.)

*Legs*: black, apparently without colour on the anterior surfaces of femora and tibiae. Coxae yellow.

*Abdomen*: The second segment shows some indication of the presence of a peculiar rather saddle-like dilatation at its posterior end, similar to that which occurs in *cucullata*. This suggests that these two species, in which alone so far as I know this structure occurs, must be to some extent related.

The abdomen is black, largely variegated with blue as follows. A large mark on either side of the first segment extending posteriorly well on the dorsum of the segment. The dorsum of each segment from 2—9 is largely covered by a pair of blue marks. These are only narrowly separated from one another by the fine mid-dorsal carina, commence at the base of the segment, but do not quite reach the apex, so that in effect the dorsum of each of these segments is blue with a black apical ring. In addition segment two has

an apical, lateral blue mark which is continuous with its dorsal markings; whilst 3—5 have separated lateral blue marks, which in the case of 3 form a continuous band, whilst in four and five they are basal only.

Segment ten and the anal appendages are entirely black.

♀ Length of abdomen 20 mm. of hind-wing. 23.5 mm.

Wings entirely uncoloured, pterostigmata black.

Head, prothorax and synthorax as in the male but the colouring appears duller.

Abdomen: first segment as in the male. The remaining segments are black, with a yellowish-brown mid-dorsal carina, which is very narrow, on segments 2—9. Segments 2-7 have each a lateral yellowish mark, which on two, three and four is a complete band, and on the remaining segments five, six and seven is broken up into apical and basal marks. Lastly there is also a series of *ventral* spots of the same colour on segments 2—6.

125. *Rhinocypha humeralis* Selys.

3 ♂♂. 1 ♀. Bettotan, July—August, 27.

(N. Borneo, Banguay, W. Kedenburg leg. Mus. Hamburg.)

The female of this species has not been described. The single specimen available is in poor condition but the following notes may be given.

The wings are relatively a little narrower and with rather less rounded apices than in the male. They have a distinct yellow tinge and the apical fifth (about) of each wing is opaque brownish-black with violet reflex, except at the extreme apex of the wing beyond the distal end of the pterostigma, this part being hyaline for a depth of two or three cells. The pterostigma is black, its distal third with an opaque milky-white mark. The apical opaque area of the wing is thus much less extensive than in the male.

On the head the colouring is yellow instead of blue which characterizes the male. There is a yellow line round the anterior part of the eye on either side and a yellow spot on the genae, the base of the antennae is also yellow, and there is a minute postocular spot of yellowish-green.

The *prothorax* has an anterior spot of yellow and two lateral spots of the same colour.

The *synthorax* has the same colour pattern as is found in the male but the ante-humeral stripe is narrower, and the blue of the male is replaced by a greenish-yellow.

The abdomen is black. The first segment has a lateral spot of dull yellow on either side. So far as I can make out each of the segments 2—8 has a lateral band of yellow running along the segment about mid-way between the dorsal and ventral lines, and below this a second longitudinal

band of the same colour which is rather shorter. The upper line on each of segments 3—8 has a basal and an apical spur projecting directly downwards towards but not meeting the lower longitudinal line: on the second segment these projections are separated from the longitudinal line.

Segments 9—10 appear to be entirely black.

Length of abdomen 17 mm. of hind-wing 20 mm.

The males are beautiful little insects quite distinct from any other Bornean species that I have seen, but de Selys believes the next species quoted to be closely allied or perhaps a local race.

\* *Rhinocypha eximia* Selys.

126. *Rhinocypha biseriata* Selys.

This is probably the commonest and most widely distributed of Bornean species of the family.

127. \* *Rhinocypha fenestrella* (Ramb.).

*fide* Fraser this species occurs in the Sintang district. (F. C. Fraser, Journ. Bombay Nat. Hist. Soc. 1927).

128. *Micromerus aurantiacus* Selys.

129. *Micromerus semiopacus* Selys.

Two males of this species, one from Lio Matu and the other from Ulu Akar, both show distinct vestigial pterostigmata on the fore-wings.

130. *Micromerus sticticus* Selys.

131. *Micromerus phaethon* sp. n.

3 ♂♂ Bettotan, 26—30, Aug., 27. 3 ♀♀ Bettotan 26th July, 27.

Length of abdomen ♂ 13.5 mm. ♀ 12.5 mm. of hind-wing ♂ 17 mm. ♀ 18 mm.

A pterostigma present on all four wings of the male.

♂ *Head*: black, bases of mandibles, genae, and a small oval spot on either side of the vertical part of the "snout" brick-red. A small circular spot in front of the base of each antenna, and a little to its inner side, also red.

A minute, linear transverse pair of spots between the bases of the antennae is lemon yellow in colour, and a pair of crescentic spots enclosing the ocelli except posteriorly, is red in front changing to blue posteriorly. A small pair of blue, oblong-oval postocular spots, and between them a very small transverse, occipital line of the same colour.

*Prothorax*: black with a pair of lateral blue spots, one on either side, and a small median spot of yellowish-blue on the middle of the posterior lobe.



**Synthorax:** black. A large cuneiform blue mark on either side of the dorsum, not reaching the alar sinus but extending for the first three-fifths of the length of the dorsum. Sides blue, outlined with black, and with a black band along the second lateral suture. Ventral surface black.

**Legs:** long and slender, black, the two posterior pairs of tibiae and femora with their anterior surfaces chalky white.

**Abdomen:** black. Segments 1—4 with pale blue band laterally, this band is just visible when the abdomen is looked at from above, and is continued as a trace on the side of the fifth segment at its base only.

Segments 6, 7, 8 have paired, dorsal spots of rich brick-red not quite touching either end of the segment, narrow and widely separated on 6, broader and nearer to each other on 7, 8.

**Wings:** with yellowish tinge. The apical fifth or a little more of the front wing is marked with brownish-black with slightly metallic reflex, the mark only reaching the posterior margin of the wing near its apex (as in *sticticus*). Pterostigmata of all four wings black. The extreme apex of hind-wing distinctly smoky.

♀ Colouring in general as in the male but much less vivid. On the head there are additional yellowish marks on the upper lip. The dorsal band on the synthorax is narrower than in the male and has rather a yellow tinge.

The abdomen has lateral yellowish marks on segments 1—8. These on segments 2—4 occupy the whole length of the segment, whilst on 5—8 they are basal only, and become progressively smaller, whilst on 7, 8 they occupy a more dorsal position. The anterior surfaces of the tibiae and femora are black and the wings uncoloured.

132. **Micromerus hyalinus** Selys.

*Rhinocypha stygia* Förster.

I believe that Förster's species is correctly referred here. His account of the male applies perfectly. Though it must be admitted that his measurement would apply only to a large specimen of *hyalinus*.

133. **Micromerus mimus** Lieftinck (Selys MSS.).

To be described from a single male from de Selys collection with the manuscript name *mimus* in de Selys writing.

Family LESTINAE.

Sub family Synlestinae.

134. **Orolestes wallacei** (Kirby).

1 ♂ 27 July, 27, 1 ♂ 1 Aug., 27, both from Bettotan.

Sub family *Lestinae*.135. *Lestes praemorsa* Selys.

I have seen a male of this species from the island of Mangalum off Jesselton on the N. W. Coast of Borneo.

## Family MEGAPODAGRIIDAE.

136. *Podolestes orientalis* Selys.137. *Podolestes chrysopus* Selys.138. *Rhinagrion borneense* (Selys).139. *Rhinagrion elopuræ* (MacL.).

## Family COENAGRIIDAE.

i. *Platycneminae*.140. *Copera atomaria* (Selys).

5 ♂ ♂ Bettotan 21st July—24th August, 27.

141. *Coeliccia campioni* Laidlaw.

5 ♂ ♂ 6 ♀ ♀ Bettotan 24th July—24th August, 27.

142. *Coeliccia flavostriata* Laidlaw.143. *Coeliccia macrostigma* Laidlaw.

1 ♂ 1 ♀ Bettotan 12—17 August, 27.

144. *Coeliccia nigrohamata* Laidlaw.145. *Coeliccia membranipes nemoricola* Laidlaw.146. *Coeliccia octogesima* Selys.

\* *Coeliccia borneensis* Selys.

ii. *Protoneurinae*.147. *Disparoneura analis* (Selys).148. \* *Disparoneura aurantiaca* Selys.149. *Caconeura dorsalis* Selys.150. *Caconeura verticalis* Selys.151. *Caconeura hosei* Laidlaw.152. *Caconeura peramoena* Laidlaw.153. *Caconeura hyperythra* Selys.

*Disparoneura moultoni* Laidlaw.

2 ♂ ♂ Bettotan 30th August, 27.

Mr. Kimmins has kindly compared the type *moultoni* with a specimen of *hyperythra* and agrees that the two are synonymous. The Selysian name ought to be *hypererythra* as the red colouring is on the dorsum of the abdomen.

154. \* *Caconeura interrupta* Selys.155. \* *Caconeura gracillima* Selys.

\* *Caconeura lansbergei* Selys.

iii. *Coenagriinae*.156. *Stenagrion dubium* Laidlaw.157. *Archibasis melanocyana* (Selys).

1 ♂ Bettotan, 27th July, 27.

2 ♂ ♂ Samawang, 15th July, 27.

"Markings on thorax and abdomen bluish-purple."

158. *Pseudagrion microcephalum* (Ramb.).

159. *Pseudagrion pruinatum* (Burm.).

160. *Ceriagrion cerinorubellum* (Brauer).

1 ♀ Kudat 11th Sept., 27.

161. *Ceriagrion bellona* Laidlaw.

162. *Aciagrion borneense* Ris.

163. *Onychargia atrocyana* Selys.

164. *Pericnemis stictica* Selys.

165. *Pericnemis triangularis* sp. n.

1 ♀ Bettotan 13th July, 28.

Abdomen 50 mm. hind-wing 31 mm.

Distinguished from *stictica* by its smaller size. Wing petiolated to about the level of the arculus. *Ac* much nearer level of second antenodal than of first. Costal side of quad-angle, of fore-wing rather less than half the length of anal side, of hind-wing just one-half the length. *M*<sub>3</sub> rises before the level of sub-nodal nerve, *Rs* at subnodus.

16.17 antenodal nerves on fore-wing.

Pterostigma almost triangular, its costal margin very short, its inner margin more oblique than its outer; the latter rather curved outward, followed by two cells which together are much deeper than the cell which immediately precedes it. The cell below the pterostigma larger and rather deeper than the pterostigma itself.

The colour of the pterostigma is grayish-brown with a border of pale yellow. (In *stictica* the whole pterostigma in the female is pale yellow).

The colouring of the body generally is very similar to that of *stictica*.

The upper lip, anteclypeus and a line across the frons immediately in front of the antennae are yellowish-white. The rest of the dorsal surfaces of the head thorax and abdomen are dark metallic green, the apical segments of the abdomen being less lustrous than the rest of the body. On the sides of the thorax and abdomen this colour fades to a yellowish-white, and segments 2—7 have each a pair of small basal lunules which are rather bluish-white.

The legs are yellowish with darker ciliae and a small darker mark at the femoro-tibial articulations.

In addition to its much smaller size (*stictica* ♀ has the abdomen 62 mm. and the hind-wing 43 mm), *triangularis* is readily distinguished by the pterostigma which is much more nearly triangular than in its larger congener, and has the outer margin less distinctly angled.

The posterior margin of the prothorax is simple. There are 16 postnodal costal cross-nerves on the anterior wing.

166. *Amphicnemis wallacei* Selys.  
167. *Amphicnemis louisae* Laidlaw.  
168. *Amphicnemis remiger* Laidlaw.  
169. *Amphicnemis madelenae* Laidlaw.  
170. *Amphicnemis martini* Ris.  
171. *Teinobasis rajah* Laidlaw.  
1 ♂ Samawang, 16th July, 27.

Mr. Kimmins has been good enough to compare this specimen with the type ♂ in the British Museum.

172. *Teinobasis* sp.  
*Teinobasis kirbyi* Laidlaw.

5 ♂ Bettotan 23rd July—17th August, 27.

I have been unable to identify these specimens with certainty. They are all in rather poor condition. In general appearance and proportion they certainly come close to my species *kirbyi* from the Malay Peninsula, so far as that species is known, and are identical with the male from Lio Matu described in my previous list.

173. *Agriocnemis femina* (Brauer).

2 ♂ Bettotan Aug., 27.

2 ♂ Sandakan July, 27. A pulverulent example.

174. *Agriocnemis alcyone* sp. n.

3 ♂ ♂, 1 ♀ Bettotan July, 27.

Length of abdomen ♂ 16 mm. ♀ 15 mm., of hind-wing ♂ 9 mm. ♀ 9 mm.

*Wings* tinged with brown, pterostigma brown, darker in the centre, its outer margin more oblique than the inner. 8 or 9 postnodal cross-nerves.

♂ *Head*: upper lip white, with a black line along its base, postclypeus white, the rest of the head black except the genae which are bluish-white, and a pair of dark blue postocular spots.

*Prothorax*: black, the anterior lobe rich blue, the posterior margin carries a rectangular projection directed upwards and backwards.

*Thorax*: black, a pair of antehumeral stripes, a broad stripe on the first lateral suture, and a stripe on the metepimerite of rich blue, ventral surfaces black.

*Legs*: femora, posterior surfaces black, anterior surfaces rich blue, ciliae black. Tibiae and tarsi whitish with black spines.

*Abdomen*: black marked with rich blue as follows. A transverse line on the middle of the side of the first segment, a pair of small oval spots on the dorsum of the second segment near its base and an apical ring on the same segment interrupted in the mid-dorsal line. A longitudinal line

on either side of segment three, wide at the base and tapering to the apex of the segment, and apparently the whole of the tenth segment.

*Anal appendages*: very similar in appearance to those of *Argiocnemis rubescens*. Upper pair seen in profile rather conical, about the length of the tenth segment, with a rounded apex. In the type male they appear to be marked with blue on their outer side. The lower pair are minute with pointed apex.

♀ In general colouring much duller than in the male. The upper lip is black with a fine paler margin, and the post-ocular spots are yellowish, not blue.

The dorsum of the synthorax is brownish-black, with a pale ante-humeral stripe on either side. The sides of the synthorax, the coxae and the legs are brownish-white rather pulverulent. The dorsum of the abdominal segments is black, the ventral surface yellowish-green. Segments 2—7 have each a lateral stripe of pale colour, extending from the base of the segment half-way or more towards the apex. This stripe is broad at the base and tapers apically; on segments 2—6 it is succeeded apically by a rounded spot of the same colour.

The species resembles closely in size and general appearance the Indian species *splendidissima*. It differs in that the upper anal appendages of the male are shorter and more conical, and in details of colouring.

175. *Argiocnemis rubescens* Selys.

#### Family PLATYSTICTIDAE.

176. *Drepanosticta rufostigma* Selys.

177. *Protosticta versicolor* Laidlaw.

178. *Protosticta kinabaluens* Laidlaw.

#### Postscript.

Since the forgoing lists were completed papers by Ris and by Lieftinck have added to our knowledge. Ris discusses and figures *Archibasis melanocyana* Selys, referring in the text to a specimen from Bettotan which I sent him for examination (Arkiv. f. Zool. K. Svenska Vetenskapsakad., 21A, No. 31, 1930.) Lieftinck has recorded the occurrence of *Argiocnemis nana* from Perak (Treubia, XII, 1930, p. 153) and has also given an admirable account of the species of *Macromia* known to occur in Malaysia (Tijd. v. Ent. LXXII, 1929 pp. 59–108). He points out that *M. moorei malayana* Laidlaw, is identical with *M. fumigata* Krüger, originally from Java. F.F.L.

[Since this paper was received Mr. W. D. Hincks has recorded in "Some Notes on a Collection of Sarawak Odonata" (Sarawak Museum Journal, IV, 1930, pp. 53, 56) the presence in Borneo of *Gynacantha limbalis* Karsch, and *Tramea virginia* Ramb. . C.B.K.]

### XIII.—THE VESPIDAE IN THE FEDERATED MALAY STATES MUSEUMS.

By CEDRIC DOVER.

The following list of *Vespidae* in the F.M.S. Museums up to 1926 is the result of the rearrangement of the material in the collection. It is published as most of the locality records are new, some species even not having been previously recorded from the Malay Peninsula. A new variety of *Montezumia burmanica* and a new species, *Ropalidia delicata*, are described, and I have added some notes compiled at the British Museum in 1924, which were omitted from my paper on the Indian species in that collection<sup>1</sup>. References to the species are not given in this note, as a full bibliography of the Malayan *Vespidae* will be found in my note on the "Wasps in the Raffles Museum, Singapore" (Bull. Raffles Mus., 2, 1929, pp. 43-52.)

It must be mentioned here that the majority of the *Vespidae* in the F. M. S. Museums have been collected by Mr. H. M. Pendlebury, and were for the most part identified and arranged by him according to Bingham's classification in the *Fauna of British India* series. My own work has, therefore, been mainly revisional, and most of such value as this note may possess must be attributed to Mr. Pendlebury's energies as a collector and student.

#### Zethinae.

##### *Labus exigua* Sauss.

Perak: Jor Camp, Batang Padang, 1,800 feet, (12.3.24.)

Pahang: Kuala Tahan (27.11.21.)

Selangor: Kuala Lumpur, 7th mile Cheras Road (1.4.23.)

I have recorded this species from Penang and Singapore, the only other Malayan records. The species is apparently distributed from Assam and Burma to Hongkong, and is also found in Western India and Ceylon. The Western Indian examples probably represent a new race as the specimens in the British Museum differ from typical *exigua*, especially in being smaller and having the petiole red. It is described by Bingham as *Labus humbertianus* Sauss.

<sup>1</sup> Doyer, Journ. Asiatic Soc. Bengal (n. s.) XX 1925, pp. 289-305, figs.

**Labus punctatus** Meade-Waldo.

The type is in the British Museum from the Kangra Valley, Sikkim. It is very close to *L. exigua*, but differs conspicuously in that the apex of the petiole is coarsely punctured, while in *L. exigua* it is shining and scarcely punctured at all. *Labus interstitialis* Cam., from Matheran, Bombay Presidency (originally described as a *Zethus*) is a very much larger species than either *L. exigua* or *L. punctatus*.

**Eumeninae.****Pareumenes quadrispinosa** Sauss.

I omitted to record the localities Hongkong and Hoabin in my note (1925). The only locality in Sikkim from which it is at present known is Rungeet valley, and in Tenasserim it is known only from Tavoy. *P. depressa* Sauss., I consider to be a variety of this species. It is represented in the British Museum from Haundraw valley, Tenasserim and Hongkong. *P. brevirostrata* is represented in the British Museum from Bombay and Travancore (not recorded by Bingham) and *P. indiana* is from the Haundraw valley only.

**Eumenes architectus** Smith.

Perak: Jor Camp, 2,000 feet (6.9.22, *E. Seimund*).

Selangor: Kuala Lumpur (throughout the year).

Peninsular Siam: Trang, Banchong. (24.4.24, *I. H. N. Evans*).

Represented in the British Museum collection from Shillong, Assam, Sikkim, Salween valley, Tenasserim, Rangoon.

**Eumenes coarctatus** race **punctatus** Sauss.

Selangor: Bukit Kutu, 3,500 feet (18.4.26), Kuala Lumpur (26.7.22).

Negri Sembilan: Labuan Padang.

Malacca: Lubok Kedondong, N. W. of Mt. Ophir (11.20, *H. C. Abraham*, "in secondary jungle").

Tioman Island off E. coast of Malay Peninsula.

My doubt of the validity of Bingham's Burmese records is apparently without foundation. There are specimens in the British Museum from Simla; Matheran and Abu, Bombay Presidency; Kashmir.

**Eumenes pomiformis** var. **affinissima** Sauss.

Selangor: Kuala Lumpur.

**Eumenes maxillosus** var. **circinalis** Fabr.

Straits Settlements: Penang Hill, 2,000-2,400 feet, Penang; Singapore Island.

Selangor: Kuala Lumpur.

Pahang: Tahan River, Rumpin and Endau rivers, E. coast.

Java: Samarang.

In the British Museum this species is represented from Timor Islands; Sandaran Agong, Korinchi Lake, Sumatra; Samoa Island.

**Eumenes caffer** var. **gracilis** Sauss.

Selangor: Kuala Lumpur.

Malacca: Lubok Kedondong, N. W. of Mt. Ophir.

**Eumenes multipictus** Sauss.

Pahang: Kuala Teku, 1,000 feet (8.12.21. "Jungle.")

**Eumenes arcuata** Fabr.

Selangor: Kuala Lumpur.

Pahang: Jerantut Ferry, Lipis-Kuantan Rd. (30.5.26.)

Perak: Jor Camp, 13-21st mile (26.8.23.)

Peninsular Siam: Nakon Sri Tamarat, Khao Ram.

West coast: Pulau Rumbia.

**Montezumia burmanica** var. **malayana** var. n.

Closely allied and resembling *M. burmanica* Bingham, in structure, but differing markedly in coloration. The following markings are yellow: a small triangular spot at the base of the mandibles on the outer side; a squarish marking on the apex of the clypeus with its sides convergent towards its apex which is deeply incised, an oval spot immediately above and adjacent to its posterior margin, which occupies the middle of the clypeus, and a sublunate mark above this on the posterior margin of the clypeus which is broadly interrupted in the middle; a conspicuous clavate marking between the antennae; a broad line on the scape of the antennae in front; a minute line behind the eyes in a straight line with the eye-incisions; a narrow line on the pronotum medially interrupted; a minute stripe on the tegulae posteriorly; a small sublunate marking on the postero-lateral angles of the mesonotum immediately behind the tegulae; a faint line at the apex of the petiole on each side; a narrow line on the basal abdominal segment above, which is not interrupted as in *M. burmanica*.

In the yellow markings on the scape and mandibles this form approaches Cameron's *M. bisulcata*, which Meade Waldo gives as a synonym of, *M. burmanica*, but it is otherwise very different.

*Holotype* ♀: Perak: Jor Camp, 1,800 feet, Batang Padang (4.5.23). Meade-Waldo says that *M. burmanica* extends to China, but I know of no records from the



Malay Peninsula. This is, I think, the first record of the genus from the Malay Peninsula. There are also specimens of *M. impavida* in the British Museum from Singapore and Thaungyin valley: of *M. burmanica* from Rungeet Valley, Sikkim; Khasi hills and Shillong, Assam; Thaungyin valley and Ataran valley, Tenasserim: of *M. indica* Sauss from Kalimpong, 6,000 feet and Foochow China. The F.M.S. Museums possesses an example of the last species from Kuala Teku, Pahang (H. C. Robinson, 26.5.1905), the first record for *M. indica* in the Peninsula.

**Odynerus (Rygchium) erythropus** Bing.

Peninsular Siam: Nakon Sri Tamarat, Khao Luang, 2,000-2,500 feet (27.3.22).

This is the first record of this species south of Tenasserim.

**Odynerus (R.) cupreipennis** Bing.

Peninsular Siam: Nakon Sri Tamarat, Khao Luang, 2,000-2,500 feet (27.3.22).

Negri Sembilan: Gunong Angsi, 2,000-2,790.

This is the first record of this species south of Tenasserim.

The specimens before me are males; this sex was previously unknown. Mr. Pendlebury has compared them with the type-female in the British Museum, and tells me that they agreed perfectly except for the usual sexual differences. The clypeus is entirely yellow, the antennae uniformly orange-yellow, and a conspicuous yellow marking extends from about the middle of the cheeks across the back of the head where it is somewhat emarginated.

**Odynerus (R.) haemorrhoidalis** Fabr.

Selangor: near Batu Caves (25.10.06.), Kuala Lumpur.

Malacca: Lubok Kedondong, N. W. of Mt. Ophir.

Pahang: Senyum and Kota Tongkat.

Peninsular Siam: Nakon Sri Tamarat, Khao Luang.

Of the variety *quinquecinctus* there are examples from Perak (Taiping,) and Selangor (Kuala Lumpur); of *ater* there is an example from Nakon Sri Tamarat, Ban Lan Sah Kah, (9.3.22.)

**Odynerus (R.) argentatus** Fabr.

Pahang: Kuala Tahan, 300 feet (21.11.21.)

Selangor: Kuala Lumpur; Tumbok Estate, Kuala Langat.

Peninsular Siam: Trang, Ban Chong (16.5.24, I. H. N. Evans), Nakon Sri Tamarat, Khao Ram, 1,200 feet, (26.2.22).

Java: Samarang.

**Odynerus (R.) flavolineatus Sm.**

Pahang: Kuala Teku.

Perak: Jor Camp (21.8.22, *E. Seimund*.)

**Odynerus septemfasciatus Sm.**

Pahang: 'Rhododendron hill, 5,200 feet, "Cameron's Highlands" (22.6.23.). Lubok Tamang, Gunong Terbakar, 4,500 feet (9.6.23.)

Selangor: Bukit Kutu, 3,500 feet (17.4.26.)

**Odynerus confluentus Sm.**

Pahang: Kuala Teku; Wray's Camp 3,300 feet, Gunong Tahan.

Selangor: Kuala Lumpur; Gombak Valley.

**Odynerus guttatus Sm.**

Selangor: Kuala Lumpur.

**Odynerus bipustulatus Sauss.**

Selangor: Kuala Lumpur (at all seasons); near Batu Caves (31.10.21); Gombak Valley; Tumbok Estate, Kuala Langat.

**Odynerus megaspilus Cam.**

Selangor: near Batu Caves (15.9.22.)

Peninsular Siam: Nakon Sri Tamarat, Khao Luang, 2,000 feet (15.3.22.).

**Stenogastrinae.****Stenogaster nigrifrons Sm.**

Selangor: Bukit Kutu (19.4.26); Kuala Lumpur; Gombak Valley.

Pahang: Raub (7.5.26.).

Perak: Jor Camp, 1,800 feet (28.2.24.)

Peninsular Siam: Nakon Sri Tamarat, Khao Luang and Khao Ram; Trang, Ban Chong (Evans, 14.5.24); Patalung, Nawongse (Evans, 11.5.24.)

This species is represented in the British Museum from Moulmein; Mergui; Thaungyin valley, Tenasserim; Sarawak, Borneo; Bangkok, Siam; Hoabin; Batavia.

*S. nigricans* Cam. (1902) and *S. serrei* du Buyss, are synonymous.

**Stenogaster jacobsoni du Buyss.**

Pahang: Rhododendron hill 5,200 feet "Cameron's Highlands" (19.6.25.)

Selangor: Bukit Kutu, 3,500 feet (4.26.)

This interesting species was originally described from Noesa Kambangan, Java (Bull. Mus. Hist. Nat. No. 7, p. 1, 1913). It is readily recognised by the spine on the

clypeus, and in specimens with the abdomen exerted four white bands on the basal and following segments are very prominent.

**Stenogaster cilipennis** Sm.

Perak: Jor Camp, 2,000 feet (22.7.22.)

Pahang: Sungei Tahan (23.11.22.)

**Stenogaster flavolineata** Cam.

Selangor: Bukit Kutu, (16.4.26); Kuala Lumpur.

Malacca: Lubok Kedondong, N.W. of Mt. Ophir, 200 feet (H. C. Abraham, 11.22 "in secondary jungle.")

The species doubtfully described by Schulthess (Zool. Jahr., 1914, p. 257, figs.) as *Ischnogaster* (*Parischnogaster*) *butteli* n. sp., is undoubtedly synonymous with Cameron's species as Schulthess himself supposed.

**Stenogaster fraterna** Bingh.

Selangor: Bukit Kutu, 3,500 feet; Kuala Lumpur; Pahang, Lubok Tamang, 3,500 feet (12.6.23.)

Represented in the British Museum from Rungeet valley, Sikkim; Margherita, Assam; Haundraw valley, Ataran valley and Salween valley, Tenasserim; Ban Samang, Luang Prabang.

**Stenogaster eximia** Bingh.

Selangor: Gombak valley; Kuala Lumpur.

Perak: Jor Camp, 1,800 feet.

Pahang: Sungei Tahan (22.11.22); Kuala Teku, 550-1,000 feet; Wray's Camp, Kuala Tahan; Bencha Forest reserve, Kuala Lipis (20.5.26); 103rd mile, Jerantut-Kuantan Road (28.5.26.)

Peninsular Siam: Nakon Sri Tamarat, Khao Ram, Khao Kao and Khao Luang, March 1922.

In the British Museum from Pundaloya, Ceylon. Mr. Pendlebury identified our specimens as *S. ornatifrons* Cam. (1902) by comparison with specimens in London. They agree very well, however, with the description of *S. eximia* and also with that of *S. ornatifrons*. It seems safe to regard Cameron's species as a synonym of *S. eximia*.

It might be useful to add here that *S. micans* Sauss, is represented in the British Museum from Yunzalin valley and Ataran valley, Tenasserim; *S. nitidipennis* (= *S. flavoplagiata* Cam. 1902 from Sarawak) from Haundraw valley; Mt. Matang, Sarawak; Bukit Besar, Peninsular Siam; *S. nigromaculata* Bingh. from Salween valley.

**Ropalidinae.**

**Ropalidia speciosa** Sauss.

A very widely distributed species in Malaya.

**Ropalidia unguolata** Bing.

Peninsular Siam: Trang, Ban Chong (*I. H. N. Evans*, 22.4.24.)

**Ropalidia erythrospila** Cam.

Selangor: Kuala Lumpur.

Peninsular Siam: Nakon Sri Tamarat, Khao Luang, 2,000-2,500 feet (27.3.22.)

**Ropalidia latebaleata** Cam.

Selangor: Bukit Kutu, 3,500 feet.

Perak: Batang Padang, Jor Camp, 1,800 feet;

Pahang Road, 12th mile.

Peninsular Siam: Khao Luang.

**Ropalidia ferruginea** Fabr.

Selangor: Kuala Lumpur.

Malacca: Lubok Kedondong, N. W. of Mt. Ophir.

Pahang: Raub.

Perak: Parit Buntar.

**Ropalidia variegata** Sm.

Selangor: Kuala Lumpur.

**Ropalidia flavopicta** Sm.

Selangor: Gombak valley.

Pahang: Kuala Tahan.

Peninsular Siam: Trang, Ban Sai Pap, (*I. H. N. Evans*, 25.4.24.)

**Ropalidia artifex** Sauss.

Selangor: Kuala Lumpur; Gombak valley.

Pahang: Kuala Tahan; Gunong Tahan, 3,000 feet.

Singapore Island: Mandai.

Perak: Batang Padang, Tapah.

Peninsular Siam: Nakon Sri Tamarat, Khao Kao, 300 feet; Khao Ram; Khao Luang.

In my paper on Indian Diptera (1925) I have placed *Polybia stigma* Fabr., as a synonym of this species but this needs confirmation. I have tentatively identified some specimens from Kuala Teku, Kuala Tahan and Gombak valley as *Polybia stigma*, as it seems possible to separate them on Bingham's descriptions. *P. stigma*, if valid, would have to be placed in the genus *Ropalidia*.

**Ropalidia delicata** sp. n.

Head, thorax and abdomen closely pitted, the pits very close on the abdomen giving it a coarse granulated appearance, finest and not very dense on the vertex and face; covered with fine silvery pubescence which is most conspicuous on the face, especially along the inner orbits,

on the median segment (which is marginally fringed), the cheeks, sides of the thorax, and abdomen; face rather broader than long; mandibles long and very sharply pointed; clypeus broadly cardiform, convex, sharply but shortly toothed at apex; inter-antennal space raised; first flagellar joint equal in length to two succeeding joints, remaining joints more or less equal in length; mesonotum slightly convex, anteriorly longitudinally carinate; scutellum rectangular, more than twice as broad as long, obscurely longitudinally grooved down the middle, this groove extending to a little before the middle of the postscutellum; postscutellum about three times as long as broad, anterior margin and sides almost transverse, posterior margin rounded; medium segment broadly excavated medially and longitudinally grooved, the excavated area more or less impunctate, the raised portions coarsely obliquely striate. The following markings are yellow: a spot, rather longer than broad, at the base of the mandibles; a semilunate marking on each side of the clypeus, a stripe on the scape of the antennae beneath; a broad line along the pronotum, which is broadest at the sides; the tegulae; two rectangular contiguous markings on the scutellum; a broad transverse stripe along the anterior half of the postscutellum, which is broadly emarginated posteriorly (beneath this emargination the postscutellum is shining and impunctate), a marking longer than broad on either side of the excavation of the median segment; the transverse stripe along the apex of the petiole and first abdominal segment. Legs ferruginous, except the coxae, trochanters and femora which are black, the anterior coxae yellow in front, the intermediate and posterior coxae with a narrow yellow stripe on the sides. Wings hyaline and iridescent, nervures brown. stigma and upper half of radial cell dark fuscous.

Length to apex of basal abdominal segment 6 mm.

*Holotype* from Kuala Lipis (Bench Forest Reserve), Pahang, F.M.S. (*H. M. Pendlebury*, 28.5.1926). *Paratype* from Sungai Tahan, Pahang (*H. M. P.* 23.11.1922), discolored through cyanide.

This species is allied to *R. aristocratica* Sauss. and *R. malayana* Cam., but differs in many points of coloration and structure.

### Epiponinae.

#### *Polybia meadeana* Schult.

Selangor: Bukit Kutu; Gombak valley.

Pahang: Kuala Tahan.

#### *Polybia orientalis* Sauss.

Selangor: Kuala Lumpur.

Perak: Tapah, Batang Padang.

Pahang: Kuala Tahan.

Peninsular Siam: Nakon Sri Tamarat, Khao Kao; Patalung, Nawongse (*I. H. N. Evans*, 2.5.24.)

***Polybia raphigastra* Sauss.**

Widely distributed all over the Indo-Malayan region. This species is better known as *P. sumatrensis*, by which name I have hitherto referred to it, but Schulthess (*Mitt. entom. Ges.*, xii, 4, p. 156, 1911) has shown that *raphigastra* has two years priority.

A closely related species (*P. pendleburyi*) which serves as a model for *Cerceris polybioides* Pendlebury, on Bukit Kutu is described by myself in *Proc. Ent. Soc. Lond.* 1, 1927, p. 40. Since writing that paper I have taken the species at Ginting Sempak hill-station on the Selangor-Pahang boundary.

### Polistinae.

***Polistes sagittarius* Sauss.**

Selangor: Kuala Lumpur.

Pahang: Gunong Tahan.

Peninsular Siam: Trang, Ban Chong.

Straits Settlements: Mandai, Singapore.

***Polistes hebraeus* Fabr.**

Selangor: Kuala Lumpur.

Pahang: Gunong Tahan, Conical Hill, 5,600 feet.

Peninsular Siam: Khao Luang, jungle, 300-1,200 feet.

***Polistes flavobilineata* Cam.**

Selangor: Gombak Valley.

Peninsular Siam: Khao Ram.

In the British Museum from Sarawak (type); Yunzalin and Haundraw valleys, Tenasserim; Mergui.

***Polistes marginalis* var. *stigma* Fabr.**

Selangor: Kuala Lumpur, 7th mile Cheras Road; Bukit Cheraka; Klang Gates.

Negri Sembilan: Labuan Padang.

### Vespinae.

***Vespa cincta* Fabr.**

Very widely distributed in the Indo-Malayan Region.

***Vespa dorylloides* Sauss.**

As widely distributed as *Vespa cincta*. The nocturnal habits of this species has been recorded by several observers.

***Vespa auraria* Sm.**

Pahang: Lubok Tamang, 3,500 feet; Fraser's Hill, 4,000 feet; Gunong Benom, 5,500-6,500 feet; No. 4 Camp, "Cameron's Highlands," 4,800 feet; Gunong Berumban, 6,050 feet; Gunong Tahan, 5,500 feet; Kuala Teku.

Perak: Jor Camp, 2,000 feet; S. Bertam, 4,800 feet.

In the British Museum from Shillong; Kumaon; Thaungyin valley.

***Vespa mocsaryana* du Buyss.**

Selangor: Kuala Lumpur.

Pahang: Senyum and Kota Tongkat.

Negri Sembilan: Bukit Tangga.

Peninsular Siam: Nakon Sri Tamarat, Khao Luang.

In the British Museum from Naga hills, Assam.

***Vespa bellicosa* var. *annulata* Sm.**

Selangor: Kuala Lumpur; Bukit Cherakah; Bukit Kutu.

Pahang: Kuala Tahan; Lubok Tamang, 3,500 feet.

Malacca: Lubok Kedondong, N.W. of Mt. Ophir.

Perak: Jor Camp, 2,000 feet.

Peninsular Siam: Khao Ram; Khao Luang.

***Vespa velutina* St. Farg.**

Java: Tjibodas; Ongop-ongop.

***Vespa magnifica* Sm.**

Selangor: Bukit Kutu.

Pahang: Gunong Tahan.

Peninsular Siam: Khao Luang.

***Vespa tyrannica* Sm.**

Straits Settlements: Selitar, Singapore, I.

#### XIV.—OLIGOCHAETA FROM THE MALAY PENINSULA.

By LIEUT.-COL. J. STEPHENSON, M.B., D.Sc., I.M.S. (ret.)  
(Text-figures 1-8.)

Two small collections of Oligochaeta from neighbouring localities in the Malaysian sub-region have recently reached me; one, the larger of the two, from Mr. C. Boden Kloss, Director of Museums, Straits Settlements and Federated Malay States, was made almost entirely by Mr. C. Dover, mostly in or near Kuala Lumpur in Selangor; the other, the smaller, which I received from Prof. R. Horst of 's Rijks Museum van Natuurlijke Historie at Leiden, had been made by Mr. J. C. van der Meer Mohr, of Medan, Sumatra, on the small island of Berhala in the Straits of Malacca.\* I owe both Mr. Kloss and Prof. Horst my thanks for the opportunity of examining these collections.

The collections are of considerable interest, since the only paper on the Oligochaeta of the Malay Peninsula appears to be that by Beddard ('00), which records only a number of species of *Pheretima* (four previously known and ten new species), and mentions *Pontoscolex corethrurus* and "a small *Benhamia*" (i.e. *Dichogaster*).\*\* Species of *Pheretima*, however, do not form more than a small part of the present collection, and I have only one new species of the genus to record, which comes not from the mainland but from Pulau Berhala.

I give lists of the species from the Malay Peninsula and Pulau Berhala separately:—

From the Malay Peninsula.

*Nais paraguayensis* Mich., f. *typica*.

*Nais paraguayensis* Mich., var. *aequalis* Steph.

*Nais malayana* sp. n.

*Dero austrina* Steph.

*Aulophorus furcatus* (Ok.)

*Aulophorus superterrenus* Mich.

*Branchiura sowerbyi* Bedd.

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\* Vide my paper "On some Oligochaetes from Berhala Island in the Straits of Malacca" in "Miscellanea Zoologica Sumatrana, xlviii, April 1930, pp. 1-5 (Published at Medan, Sumatra).

\*\* There are a few descriptions of species from the Malay Peninsula in other papers, e. g. Michaelsen ('03) (*Pheretima dunckeri*, *Glyphidrilus malayanus*).



*Aulodrilus remex* Steph.  
*Megascolex mauritii* (Kinb.)  
*Pheretima campanulata* (Rosa)  
*Pheretima indica* (Horst)  
*Pheretima planata* Gates.  
*Perionyx excavatus* E. Perr.  
*Perionyx* sp.  
*Octochaetus fermori* Mich.  
*Dichogaster malayana* (Horst)  
*Dichogaster doveri* sp. n.  
*Kerria selangorensis* sp. n.  
*Pontoscolex corethrurus* (F. Mull.)

From Pulau Berhala.

*Pheretima indica* (Horst)  
*Pheretima berhalana* Stephenson.  
*Perionyx violaceus* Horst.  
*Pontoscolex corethrurus* (F. Mull.)  
*Glyphidrilus horsti* Stephenson.

In the first list *Nais malayana*, *Dichogaster doveri*, and *Kerria selangorensis* are new, and in the second I have described *Pheretima berhalana* and *Glyphidrilus horsti*.

### Geographical Distribution.

The collection from the mainland of the Malay Peninsula, though not large, very greatly widens our conception of the Oligochaete fauna of the region. Beddard's paper mentioned no Microdrili, and was liable to give the impression that the earthworms of the region belonged at any rate for the far greater part to the genus *Pheretima*. The present collection adds eight fresh-water forms, and seven species of earthworms outside the genus *Pheretima*, which is very far from being overwhelmingly predominant.

The outstanding fact which impressed itself more and more on me as I worked through the worms from the Malay Peninsula was the similarity to the Indian fauna,—and not only to that of Burma, which might have been expected, but even to that of peninsular India.

Thus *Nais paraguayensis* f. *typica* is found throughout the length of India; the f. *aequalis* is recorded from Bombay and the Central Provinces; *Dero austriana* from

Madras and Trivandrum in the south of India; *Aulophorus furcatus* is found throughout the length of India and at Rangoon in Burma; *Branchiura sowerbyi* throughout India, including Burma and Assam; *Aulodrilus remex* is known from the Central Provinces and from Travancore in the south of India; *Pheretima campanulata* is a specially Burmese species, though Gates ('27) conjectures that it may have been recorded under the name of *P. houlleti* from Sumatra and possibly from the Bahamas; *Pheretima planata* is also a specially Burmese species (which however enters Assam),—and the presence of these two species does certainly link the Oligochaete fauna of the Malay Peninsula more closely to Burma than to peninsular India; *Octochaetus fermori* is distributed throughout the length of India, but has not yet been recorded from Burma.

Several species are well-known wanderers, whose presence would be expected, and give no distinctive character to the fauna; this is the case with *Megascolex mauritii* and *Pontoscolex corethrurus*, found in both peninsular India and Burma, as well as over a wide area outside these regions; *Pheretima indica* is widely spread in the East, though it has not yet been found in India; *Perionyx excavatus* is one of the common worms of peninsular India and Burma, and also occurs in Further India and the Malay Archipelago; *Dichogaster malayana* has been recorded from numerous localities in the Malay Archipelago, and has also been found in South India.

The new species from the Malay Peninsula are interesting in several ways, but they do not give the Oligochaete fauna of that region a character distinct from that of India.

(1) *Nais malayana* shows a transition stage between the genera *Nais* and *Dero*; it possesses a large respiratory fossa at the hinder end of the body, formed by the opening out of the terminal portion of the intestine, but no branchiae have been developed in the fossa. It is also peculiar in the genus in the distribution of the dorsal setae, which begin in segm. iv.

(2) *Dichogaster doveri* is a small worm, like many other species of the genus which are found in the Indian and Malayan areas. Many of these are peregrine forms which have spread widely in the East; it may be that their original home is in Africa, where the genus is endemic and occurs in great strength, and where they may yet be found; or it may be that colonies, originally transported from Africa, have in course of time become modified into new species in their new homes.

(3) *Kerria selangorensis*: The presence of an apparently endemic species of the genus *Kerria* is one of the most surprising features of the collection. The genus mainly inhabits Paraguay and Brazil; there are endemic species in Lower California and the West Indies, and a peregrine species in South America, South Africa, New Caledonia and New South Wales. With this peregrine species *K. selangorensis* has apparently no connection; in most respects (though not in the important character of the oesophageal sacs) its nearest ally appears to be *K. kukenthali* from the West Indies. The origin of *K. selangorensis*, and the presence of a member of the genus in this part of the world, must for the present remain unexplained.

(4) Though not a new species, *Aulophorus superterrenus* claims a few words. The occurrence of specimens which are scarcely to be distinguished by any structural character from the *A. superterrenus* of Michaelsen ('12), known only from Costa Rica in Central America, would be remarkable; but it is made more remarkable by the fact that in both places the worm has been found, not in ponds or streams, but only, as the name implies, above the surface of the ground,—in Selangor in a tree-hole, in Costa Rica in small collections of water held by the leaves of epiphytic Bromeliaceae.

The only difference between Michaelsen's specimens and mine is in the dorsal pair of gills. In those described by Michaelsen, along with some other peculiarities of form, the dorsal pair of gills are continuous with each other across the middle line, and the lateral portion on each side is cut off as a separate gill; while in the present specimens these peculiarities are absent, and other small variations may make their appearance. But greater differences than this may occur within the limits of a species; thus in *A. furcatus* there may be either two pairs of true and one pair of secondary, or three pairs of true and one pair of secondary gills, or any intermediate condition (Stephenson, '16); and (see above) along with one pair of secondary gills either three or four pairs of true gills may occur in *Dero austrina*. It is thus impossible to separate the Malayan and Central American specimens as distinct species on the ground of the slight divergence in the gills.

The species may possibly be found in the future at intermediate localities between the two widely separated regions from which alone it is known at present; on the other hand, possibly Selangor and Costa Rica are the only remaining localities of a once extensive and continuous distribution; or, finally, it may be that the particular group

of morphological characters which constitute the species has been evolved independently in the two hemispheres, *i.e.*, the two groups of specimens represent a case of convergence.

In the small collection from Pulau Berhala, besides the well recognized wanderers *Pheretima indica*, *Perionyx violaceus* and *Pontoscolex corethrurus*, there were two new species, *Pheretima berhalana* and *Glyphidrilus horsti*. Of these the latter agrees with the eastern (as distinguished from the western or African) species of the genus in the forward position of the clitellum and ridges of puberty (cf. Michaelsen '10). Michaelsen had previously ('03) described *G. malayanus* from a neighbouring locality (Pahang River); from this, however, the present species is quite distinct.

### Fam. NAIDIDAE.

#### Genus Nais Müll., *cm.* Vejd.

##### *Nais paraguayensis* Mich., f. *typica*.

Stream in Batu Caves (Dark Cave), near Kuala Lumpur, Selangor, F.M.S. 2. viii. 26. C. Dover. Ten specimens.

Ampang Waterworks, Kuala Lumpur, Selangor, F.M.S.; among polyzoa, 5. ix. 26. C. Dover. Several specimens.

The specimens of the first batch were all small, only 3-5 mm. in length.

##### *Nais paraguayensis* Mich., var. *aequalis* Steph.

Lake Gardens, Kuala Lumpur Lake; twined round stems of *Utricularia*, also found within the bladders of the plant. 21. vii. 26. C. Dover. Several specimens.

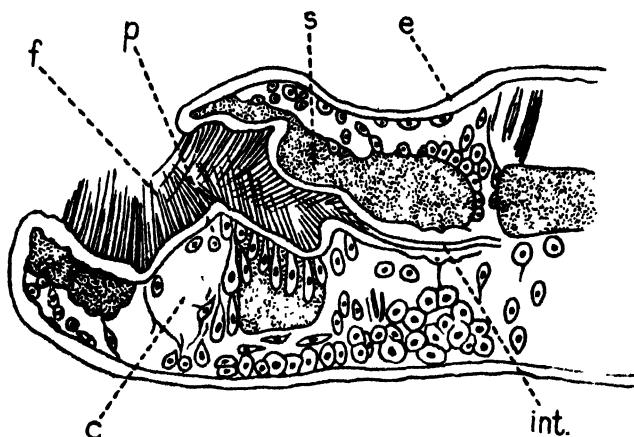
The average length was 7 mm.; some specimens were longer, others shorter, down to 4 mm. Segms. 36, 55, 70, all w. a zone at the posterior end in wh. segments have not yet been differentiated. The worms were thus longer, and presented a larger number of segments, than the original specimens of the variety described from India.

The first four ventral setal bundles, situated on the bulbous "head," are placed closer together than those of the rest of the body, and the setae of these bundles differ in character from the rest. Thus in the body generally the proximal prong of the ventral setae is 2-3 times as thick as the distal, while both prongs are about the same length, and the setae are 3-4 per bundle; in the first four bundles both prongs are longer than those behind, the distal being somewhat longer and thinner than the proximal, and the setae are 5 per bundle.

Sometimes two hair-setae were seen in the dorsal bundles, and sometimes two needles. The essential character of the variety is the approximately equal prongs of the dorsal needles.

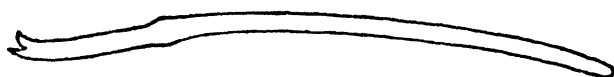
***Nais malayana* sp. n. (figures 1, 2).**

Tree-hole near Pond H, Kuala Lumpur, Selangor, F.M.S. 24. viii. 26. C. Dover. Eleven specimens, in a quantity of bright yellow debris, which adhered to them in such quantity that it had to be brushed off with a camel-hair pencil before they could be examined.



1

Fig. 1. *Nais malayana*; longitudinal section through respiratory fossa,  $\times 400$ . c, coelomic cavity; e, surface epithelium; f, respiratory fossa lined by long cilia; int., intestine; p, projection of floor of fossa; s, intestinal blood-sinus.



2

Fig. 2. The same; dorsal needle-seta,  $\times 1350$ .

Small greyish worms, of an average length of 5 mm., the shortest measuring 3 mm.; diameter 0.3 mm. Number of segms. in different specimens 37, 56, 58, 73. No budding zone was seen. The surface of the body is apparently rather sticky; some of the yellow debris was still adherent even after pencilling.

The head is slightly swollen, and bulbous in appearance; the prostomium is blunt, and cut off squarely in front in those specimens which seem to be most characteristically shaped; in others the prostomium is rounder (in these possibly separation has only recently taken place). The segments are shorter in the head than in the rest of the body, and the first four ventral setal bundles are placed closer together than the others (compare the last species). There are no eyes.

The anus is postero-dorsal, and appears as a large fossa w. contracted wrinkled margins, as if the opening might have been even larger, and possibly the margin everted, during life; the lower or posterior margin is prominent, projecting behind. The whole is very strongly reminiscent of the branchial fossa of a *Dero*, but there are no gills; examined in balsam there is in some specimens an appearance of a single median pyramidal elevation on the floor of the fossa, with a lymph space in its interior.

In order to confirm these relations, I cut sections of the hinder end of one specimen, and reproduce the most typical of the sections (fig. 1). The wide fossa-like ending of the alimentary canal, the backwardly projecting lower margin, the pyramidal elevation on the floor of the fossa, and the lymph space in its interior are seen; the fossa is clothed by a layer of extraordinarily long cilia. The blood-sinus of the intestine extends to the extreme margin of the fossa both above and below. It seems fairly certain that though there are no gills the fossa in this species has a respiratory function.

From the absence of a budding zone in any of the eleven specimens it would appear that reproduction takes place, as in *N. paraguayensis*, by fragmentation and subsequent regeneration of the posterior and anterior ends of the anterior and posterior fragments respectively, rather than by the production of a budding zone of new segments and subsequent fission. In one specimen w. a bluntly pointed anterior end the dorsal and ventral setae begin in the same segment, close to the anterior end; i.e., fragmentation has recently taken place, and the regeneration of the anterior segments has not yet had time to occur. In another, the prostomium has not yet attained what is apparently its characteristic form; but there are two small newly formed bundles of ventral setae, short and difficult to see, at the anterior end,—i.e., regeneration is in progress though not complete.

From the fact that the first four setal bundles are closer together than the rest, the (achaetous) first segment and the first three setigerous (ii, iii, iv) segments being shorter than the others, it appears that these segments (four only, not five, as is usual in this and a number of other genera of the family) are produced anew when a head is regenerated by the posterior of the two components separated by fission. Of these regenerated segments the last (segm. iv) produces dorsal setal bundles as well as ventral (in this genus as a rule none of the newly formed head segments produce dorsal setal bundles).

The ventral setae begin in segm. ii, and are 3-4 per bundle throughout the body; they have the usual double-pronged form. There is no difference of type between those of the first few segments and those of the remaining part of the body; the shaft is moderately curved, the nodulus slightly distal to the middle of the shaft; the proximal prong is a little thicker than the distal, the distal however is rather the longer of the two. In length, the setae of segm. ii measure, in each of several worms,  $67\mu$ ; in others, only  $50\mu$  but perhaps these were newly formed and had not finished growing; in segms. iii and iv setae of  $56\mu$  or  $54\mu$  were found, while further back, and also towards the hinder end, setae of  $56\mu$ ,  $59\mu$ , and  $61\mu$  were measured.

The dorsal setae begin in segm. iv; the bundles consist of hair-setae and needles. In the anterior segments there are often two hairs per bundle, in the posterior one only; the hairs are equal in length to the diameter of the body,—0.25 mm. *plus* the portion embedded in the parietes; they are smooth, and none are specially elongated. The needles (fig. 2) are one or two per bundle,—one more commonly, even when there are two hairs. In length the needles are about  $60\mu$  ( $59-61\mu$ ); the tip is bifid, both prongs being rather short, the proximal rather thicker than the distal; the shaft is only slightly curved, and there is a slight nodulus one-fourth of the length from the distal end.

The dorsal wall of the pharynx is covered by a close layer of extremely long rodlets ( $8\mu$  in length), the floor of the pharynx by long cilia.

Chloragogen cells begin in segm. vi.

Chromophil cells (pharyngeal gland cells) are present in masses by the side of the pharynx and on the anterior part of the oesophagus, in segms. ii-vi; these masses have the characters of "septal glands," though they are not specially related to the septa; in segms. v and vi they form large well defined aggregates, in iii and iv the form of the masses is less definite.

There is no stomachal dilatation.

The coelomic corpuscles are round or slightly oval,—probably in reality disc-shaped; their average diameter is 11 ; there is a small central nucleus, otherwise their interior is homogeneous.

The present species is remarkable in several ways:—

(i) It is the first species of the genus to be described in which the dorsal setae begin in segm. iv; indeed it is part of the definition of the genus that these setae begin in vi. It might thus seem to be equally correct to place

these specimens in the genus *Naidium*, the most obvious distinction of wh. from *Nais* is that the dorsal setae begin w. the ventral in segm. ii; these worms might either be a *Nais* in which the dorsal setae begin two segments in front of, or a *Naidium* in which they begin two segments behind their usual position.

(ii) The number of segments newly produced in the head of the posterior of the two daughter worms is here four (and a prostomium), while usually in the genus it is five; it follows from this that the last of the newly produced segments here bears a pair of bundles of dorsal setae, while in the genus in general none of the (five) new head segments bear dorsal setae. The number of new head segments shows that the affinities of the present specimens are w. *Nais* rather than with *Naidium*, since in the latter genus seven new segments are produced in the budding zone to form the new head.

(iii) The respiratory fossa strongly resembles the branchial fossa of the genus *Dero*, though it does not contain branchiae. As in *Dero*, the fossa is the expanded terminal portion of the intestine; this is shown by the copious ciliation, and by the extension of the intestinal blood-sinus to its extreme margin. The present specimens thus figure for us a stage in the evolution of the genus *Dero*; though of course there is no sufficient reason for saying that *Nais malayana* is the actual ancestor of *Dero*,—the enlargement of the terminal portion of the intestine to form a respiratory fossa may quite well have been evolved more than once in the Naididae. It is however interesting to note that in *Dero austrina* (S. India and Malay Peninsula, v. post.) the dorsal setae, exceptionally in the genus, begin, as in the present species, in segm. iv.

#### Genus *Dero* Ok.

##### *Dero austrina* Steph.

Ditch near hot water spring, Setapak, Kuala Lumpur. 20. viii. 26. C. Dover. Five specimens.

Pond H, Kuala Lumpur, Selangor. 24. viii. 26. C. Dover. A single specimen, with a specimen of *Branchiura sowerbyi*.

The setae seem to be somewhat variable in this species; while the correspondence of the present specimens with the original description of the species (Stephenson, '25) is sufficiently close, the following divergences in one of the examples (that from Pond H) may be noted.

The nodulus was at the middle of the shaft in the ventral setae of segms. ii, iii and iv; in v it was slightly distal (11:13), and in vi frankly distal (42:55). Towards



the hinder end the nodulus was seen to be practically at the middle (distal in the ratio of 45: 47), but a little in front of the above it was distal (10: 13, or 11: 13, or 42: 50). In segms. ii-v the distal prong was one and a half times as long as the proximal, and equal to it in thickness at the base. The curve of the shaft seems to be less in the most anterior segments. There may however be differences between the setae even in the same bundle; thus in segm. v one seta was  $97\mu$  long, w. the nodulus very slightly proximal, while the next to it was  $105\mu$  in length, w. the nodulus at the middle.

There would appear also to be some variability in the gills in this species (compare a similar case of variability in *Aulophorus furcatus*, discussed in Stephenson, '16). The original account of *Dero austrina* describes three pairs of true and one pair of accessory (secondary) gills, the latter small projections of the dorsal margin of the branchial fossa. Aiyer ('29) figures four pairs of true gills and one pair of secondary, the latter, as in my first examples, situated on the anterior border of the fossa;—"though they can be retracted slightly beneath the anterior margin, they appear to be continuous w. it when the fossa is fully expanded." In the present specimens there are four pairs of gills, but the anterior (dorsal) pair appear to be true gills, arising distinctly within the margin of the fossa, and (in the second batch at any rate) one of the more posterior pairs seems to be of the nature of accessory gills, arising from the margin, not within it. But observations on fixed (and in some degree contracted) material are liable to error, however carefully made.

### Genus *Aulophorus* Schmarda.

#### *Aulophorus furcatus* (Ok.)

Lake Gardens, Kuala Lumpur Lake, Selangor; among *Utricularia*. 21. vii. 26. C. Dover. A single specimen, along w. *Nais paraguayensis* var. *aequalis*.

#### *Aulophorus superterrenus* Mich. (figure 3).

Morib, Selangor (W. Coast); from tree-hole about four feet from ground. 7. viii. 26. C. Dover and M. Heynes-Wood. A number of specimens.

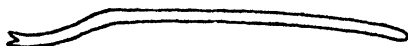


Fig. 3. *Aulophorus superterrenus*; dorsal needle-seta,  $\times 1000$ .

Small whitish worms, mostly broken up into fragments. Length about 10 mm.; diameter 0.24—0.35 mm. Two specimens, wh. showed no budding zone, had respectively 91 and 101 segments; another, apparently the anterior of a chain of two wh. had only recently separated (the gill region being in course of formation), had only 41.

Two other specimens throw further light on the process of fission in this species. In one, w. 67 segments (*plus* a zone at the hinder end in wh. new segments were forming but not yet differentiated), the head was quite absent, and there was no mouth; the epidermis covered the anterior end without break of continuity, while both ventral and dorsal setae were present up to the anterior end; separation thus (as already indicated by the previous specimen w. 41 segments) apparently takes place without the previous production of new head and tail ends in the budding zone.

In another specimen w. 72 segments a head of abnormal shape was present, w. the mouth not yet patent; the first two bundles of ventral setae had no corresponding dorsal bundles, but were themselves by no means young setae, being spaced like the rest, and their segments obviously not newly produced. As will be mentioned, the dorsal setae in this species begin in segm. iv; and in this example, therefore, the usual arrangement of setae had been attained, it would seem, not, as in other cases, by the production of a new prostomium and new head segments, but by the re-modelling (regulation) of the head end and the shedding of the dorsal setae of the two anterior setigerous segments.

The prostomium is often very blunt, almost square, snout-like; though sometimes it may be hemispherical and simply rounded. There are no eyes.

The dorsal setal bundles begin in segm. iv, and are composed of one or two, or occasionally even three, needle-setae and one or two hairs; in the anterior region in some specimens three hairs may be seen, one of wh. may be thinner and shorter than the others; many specimens have two hairs in most bundles till towards the hinder end, where one is more usual, but in some specimens one is the commonest number through the greater part of the body. The longest hairs are 0.37 mm. in length, and are thus longer than the diameter of the body; ordinarily they are about equal to the diameter,—0.25 mm. or thereabouts. The needles are 54 $\mu$  in length, and of the form shown in fig. 3.

The ventral setae begin in segm. ii, and are 5, 6, 7, or 8 per bundle in the anterior segments, and still 5 and finally 4 per bundle towards the hinder end; they are 63–72 $\mu$  in length (63 $\mu$  in segm. iii, 67 $\mu$  in VIII and also in the middle of the body), and about 2.5 $\mu$  in thickness; the prongs are about equal in length, but the proximal prong is twice as

thick at the base as the distal; the curvature of the shaft is rather gentle and graceful; the nodulus is distally situated (2:3). There is no difference in type between the ventral setae of the first few segments and the rest.

The gills are three pairs, all "true" gills; they are somewhat flattened from side to side, and hence lamellar in form. The present specimens differ from those originally described by Michaelsen in the fact that the anterior gill is not divided, and is not continued to join its fellow across the middle line. There is no indentation of the anterior border of the fossa; but in several specimens there appears to be a thickening of the anterior border, wh. may be one-sided; in one there seems to be a thickened connection between this and the anterior gill. In one specimen there was a rudimentary fourth pair of gills, a thickening of, or within, the margin of the fossa on each side, clearly though narrowly separated from the anterior gill.

The palps diverge moderately, measure nearly 0.2 mm., and are narrow in their whole length, tapering slightly towards the tip. The outline of the branchial fossa is oval or almost spherical.

The chloragogen cells begin in segm. vi; there is no stomachal dilatation on the alimentary canal.

#### Family TUBIFICIDAE.

##### Genus *Branchiura* Bedd.

##### *Branchiura sowerbyi* Bedd.

Pond H, Kuala Lumpur, Selangor, F.M.S. 24. viii. 26. C. Dover. A single specimen, w. a specimen of *Dero austriana*; yellow debris adherent, as in *Nais malayana*.

##### Genus *Aulodrilus* Bretscher.

##### *Aulodrilus remex* Steph.

Lake Gardens, Kuala Lumpur Lake, Selangor; in mud. July 1926. C. Dover. A number of specimens.

The specimens are partly enclosed in friable tubes, composed of fine grains of reddish earth; the worms come away easily on breaking up the tube w. needles under the binocular; a little of the earthy matter remains adherent, but the cleaning can be completed by pencilling. The longest tubes enclose more than half (about three-fifths) of the worms, but some specimens are only covered for a quarter or a third of their length. I did not see any branched tubes like those described by Aiyer ('25).

The hindmost part of the body shows a series of close annulations, more numerous than the segments,—about three to a segment. These occupy the region behind the last setal rudiments, and extend forwards for some distance into the region of the newly forming setae. The annulation

does not help towards distinguishing the segments; the grooves at the segmental limits (if indeed any of the grooves coincide w. the segmental limits) are of no greater depth than the rest.

Appearances here and there suggest the approach of fragmentation; a number of constrictions may be present, deeper and more definite than the divisions between the segments, rather reminiscent of approaching division in one of the Naididae (e.g. *Chaetogaster*), though there is no budding zone.

The ventral setae begin to be double-pronged only about the middle of the body. The dorsal bundles may have as many as seven needles and eight hairs; six needles and six hairs were also seen, regularly alternating; the hairs begin in segm. iii, iv or v.

### Family MEGASCOLECIDAE.

#### Subfam. MEGASCOLECINAE.

#### Genus *Megascolex* Templeton.

#### *Megascolex mauritii* (Kinb.)

Drain in Museum compound, Kuala Lumpur. 28. xii.

26. C. Dover. A single specimen, sexually mature.

In ditch, Museum compound, Kuala Lumpur, Selangor.

8. i. 27. C. Dover. Numerous specimens, the majority mature.

#### Genus *Pheretima* Kinb.

#### *Pheretima campanulata* (Rosa.)

Kuala Lumpur, Selangor, F.M.S. Kampong Bahru.

21. i. 27. Sulaiman coll. A single specimen, mature; the hinder end separated as two small fragments.

The specimen agrees w. the description of *P. campanulata* as given by Gates ('27) (who distinguishes this species from *P. houlleti*, w. wh. it had been united by Michaelsen) in length, diameter, dorsal pores (not exactly, but nearer *campanulata* than *houlleti*), in seta *a* not being enlarged, in the numbers of the setae (nearer, at least, to *campanulata* than to *houlleti*), in the number of stalked glands associated w. the spermathecae, and in the characters of the spermathecal diverticulum; penial setae were not searched for.

#### *Pheretima indica* (Horst) f. *typica*.

Pulau Berhala, Straits of Malacca; in rotting plantain trunks. 8. vii. 27. van der Meer Mohr. Two specimens, one sexual; much softened.

Dark Cave, Batu Caves, Selangor, F.M.S.; 500 feet from entrance, under stones in damp guano. 1. viii. 23. C. Dover. Eleven specimens, along with a few smaller and immature.

***Pheretima planata* Gates. (figures 4, 5).**

In ditch, Museum compound, Kuala Lumpur, Selangor, F.M.S. 8. i. 27. C. Dover. Several specimens, one mature.

A few additional notes may be given, to supplement previous descriptions.

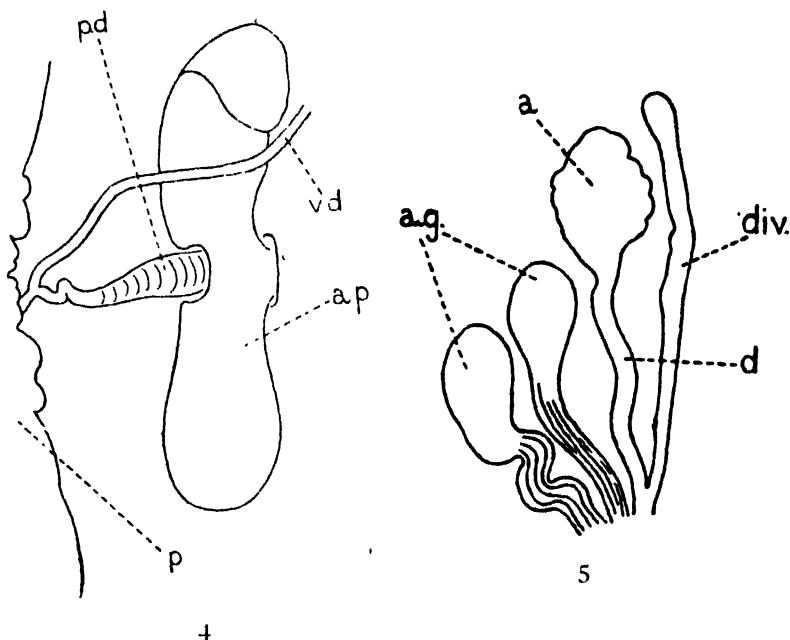


Fig. 4. *Pheretima planata*; accessory prostate gland. a.p. accessory prostate; p, prostate; p.d., prostatic duct; v.d., vas deferens.

Fig. 5. The same; spermathecal apparatus. a, ampulla of spermatheca; a.g., accessory glands; d, duct of spermatheca; div. diverticulum.

The prostomium is small, and hardly projects at all; it is marked by a slight longitudinal groove; in form it is epilobous  $\frac{3}{4}$ , the grooves at the sides being well marked, and the tongue open behind; there are other grooves on segm. i round the mouth.

The numbers of setae are greater than previously recorded; 84/v, 88/ix, 80/xii, 76/xix, and 55 in the middle of the body.

The everted copulatory sacs form cauliflower-like excrescences, as in one of my previous specimens (Stephenson, '26).

The spermathecal apertures are accompanied by one or two small round darkly pigmented papillae, wh. however hardly project, situated immediately behind the aperture;

the whole, aperture and papillae, is surrounded by a rather lighter area of some little size. I did not see these papillae in my former specimens; Gates ('26) however mentions papillae at the spermathecal apertures.

The seminal vesicles are not lobed ("only slightly lobed" in my previous specimens).

Numerous muscular bands pass between the lateral and ventral regions of the body-wall in the prostatic region; after cleaning these away, along w. some connective tissue, a large gland is revealed (fig. 4), consisting of two rounded lobes, an anterior and a posterior, each lobe rather elongated antero-posteriorly, the anterior lobe in front of the entry of the prostatic duct into the body-wall, the posterior behind it. The prostatic duct enters the parietes immediately to the inner side of and partly surrounded by the middle part of the gland where the anterior and posterior lobes join; the gland itself is attached to the body-wall at this point. In my previous account the accessory prostate glands are described as being numerous,—four or five in front of and as many behind each copulatory sac. Gates however speaks of a single globular mass in front of and one behind the sac, each of wh. seems to be an aggregate of glands w. their own ducts.

The ovaries are again peculiar in form,—small ovoid rounded masses, w. a few minute projections (ova) at one part.

I give a fig. of the spermathecal apparatus (fig. 5). The proportions of the somewhat wrinkled ampulla and the duct will be seen; there may be either one or, as figured, two accessory glands w. rounded ental ends and obvious longitudinal striation of their stalked portions.

### Genus *Perionyx* E. Perr.

#### *Perionyx excavatus* E. Perr.

Kuala Lumpur, Selangor, F.M.S.; on bark of tree near edge of pond in Batu Road. 6. ix. 26. C. Dover. A single specimen, not yet mature.

Taiping, F.M.S.; in tree-hole four feet from ground; very common. 9. iii. 27. C. Dover. A number of specimens, some with commencing sexual characters, but none with clitellum.

The specimen from Kuala Lumpur is of interest on account of the penial setae. These are just beginning to develop, and are mixed with ordinary setae and transition forms; indeed none of the setae have fully attained the characters of the typical penial setae of *P. excavatus*.

#### *Perionyx* sp.

In ditch, Museum compound, Kuala Lumpur, Selangor, F.M.S. 8. i. 27. C. Dover. A single specimen, immature.

## Subfamily OCTOCHAETINAE.

Genus *Octochaetus* Bedd.Subgenus *Octochaetoides* Mich.*Octochaetus (Octochaetoides) fermori* Mich.

In ditch, Museum compound, Kuala Lumpur, Selangor, F.M.S. 8. i. 27. C. Dover. Several specimens, mature.

## Subfamily DIPLOCARDIINAE.

Genus *Dichogaster* Bedd.*Dichogaster malayana* (Horst)

Kuala Lumpur, Selangor, F.M.S.; on bark of tree near edge of pond in Batu Road. 6. i. 26. C. Dover. Four specimens, much decomposed.

*Dichogaster doveri* sp. n. (figures 6, 7).

In ditch, Museum compound, Kuala Lumpur, Selangor, F.M.S. 8. i. 27. C. Dover. Six specimens, mostly mature.

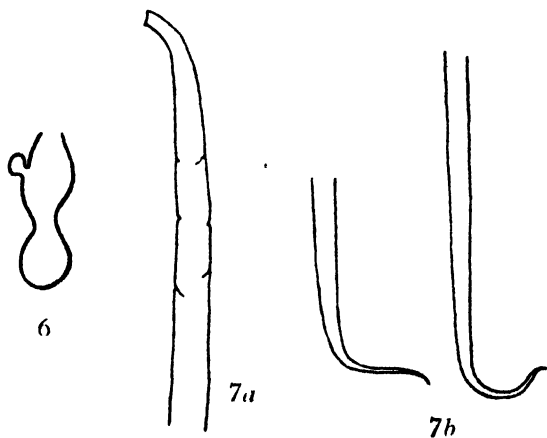


Fig. 6. *Dichogaster doveri*; spermatheca.

Fig. 7. The same; penial setae, two forms, a and b; a  $\times$  about 1350, b  $\times$  about 1800.

*External Characters.*

The length varies in fully mature specimens from 27 to 60 mm., the diameter from 1 to 2 mm. There is an absence of pigment, the colour a light grey; the clitellum is a rather light brown. Segms. 115-118.

The prostomium is pro-epilobous; a short longitudinal groove is continued back from the prostomium, cutting through segm. i. Segms. i and ii are not delimited from each other by a furrow.

The dorsal pores begin in furrow 5/6; in one specimen there is a pitting in 4/5, but I am not certain that it was pervious.

The setae are rather closely paired; all are situated ventrally. In front of the clitellum  $aa=4ab$ , and is almost equal to or slightly less than  $bc$ , while  $ab=cd$ ; behind the clitellum  $aa=5ab=bc$ , and  $ab=cd$ ; towards the hinder end  $aa$ —or is slightly less than  $bc$ ;  $dd=\frac{3}{4}$  of the circumference or more,—it may be  $\frac{3}{4}$ . There is some variation in the setal intervals; thus in the middle of the body  $aa$  may be a third greater than  $bc$ ; but the ratio may vary within a few segments,  $aa$  being equal to, greater than, or less than  $bc$ . The setae  $ab$  are larger than  $cd$  throughout the body.

The clitellum, smooth and w. visible setae, extends over segms. xiii-xx ( $=8$ ); it is ring-shaped, round segms. xiii-xvi at least, though behind this it is interrupted ventrally by the male field on segms. xvii-xix, and is lacking on xx behind the male field; in a less fully mature specimen there was a ventral hiatus in the clitellum on segm. xiii also.

The male field is a whitish area, square, or rectangular w. the longer diameter longitudinal. The seminal grooves are straight, extending from the anterior prostatic pores at the situation of the setae  $a$  of xvii to the posterior pores at the situation of  $a$  of xix; the male pores are doubtfully seen in the course of the grooves at their middle points.

The female apertures are paired, on segm. xiv, their situation being indicated by a circular whitish mid-ventral area, wh. includes setae  $a$  on each side but scarcely  $b$ .

The spermathecal pores are two pairs, in furrows 7 8 and 8/9, in or immediately internal to the line of setae  $a$ .

#### *Internal Anatomy.*

Septum 5/6 is present, perhaps slightly thickened as compared w. those behind the genital region; but succeeding septa are difficult to distinguish and to number correctly, since several septa are pushed some distance backward from their normal position. After 5/6, 6/7 may be present in part, or on one side; then come two thin septa, 8/9 and 9/10; the next, 10/11, is thickened and united peripherally w. 9/10. Septum 7/8 is absent.

There are two gizzards, firm and well developed, in segms. vii and viii separated by a distinct groove, though there is no septum between them. Here again the determination of the position is difficult, and it seemed at times,



in one or other of the four specimens dissected, that the gizzards were in vi and vii (this certainly seemed definitely so in one specimen), or in viii and ix.

The calciferous glands are three pairs of conspicuous white kidney-shaped organs in xiv-xvi, attached to the oesophagus by the hilus. The intestine begins in xvii.

The last hearts are in segm. xi.

Behind the clitellar region the nephridia appear as flattened discs arranged in pretty regular longitudinal rows, usually four on each side per segment; the innermost nephridium on each side is usually smaller than the others.

Male funnels are present in segm. x, and were doubtfully seen in xi. Seminal vesicles were present in segms. xi and xii in two specimens, small in both segments, elongated in xi and racemose in xii; in a third they were present, small and racemose, in xii only, while in a fourth specimen besides the pair in xii there was a rather rudimentary pair in ix, as a ridge on each side of the anterior face of septum 9/10.

The prostates are two pairs, small, tubular or somewhat flattened (tongue-shaped) organs in xvii and xix.

The spermathecae (fig. 7) are two pairs, small and situated at the sides of the nerve cord. The ampulla is shortly ovoid: the duct is ovoid, rather longer than the ampulla, sometimes shining (i.e. muscular, the ampulla being of an opaque white colour), and separated from the ampulla by a constricted neck. The diverticulum is small, rounded, and attached by a very short stalk to the duct at about the middle of its length. The proportions of the parts vary somewhat in different specimens.

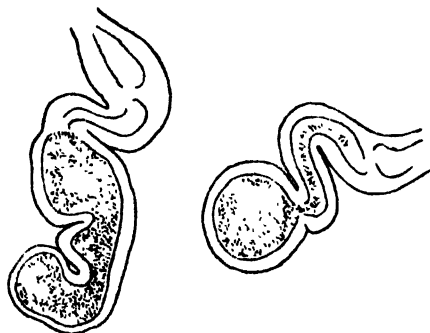
The penial setae are of two kinds, one of each kind in each bundle:—(i) (fig. 8a) length 0.38–0.42 mm., thickness near base 6–9 $\mu$ ; shaft almost straight, gently bowed, more particularly near base; tip either w. somewhat increased curvature or merely continuing curvature of shaft, tapering but cut off squarely at the end; ornamentation near distal end consisting of a few slight or very slight irregularities of contour, wh. may become almost small teeth. (ii) (fig. 8b) length 0.31–0.37 mm., thickness near base 5 $\mu$ ; shaft practically straight or very gently bowed; distal end tapering rapidly, and at the tip, wh. is bent into the form of a shepherd's crook, or to a right angle only (both forms shown in fig.), is very fine and hair-like; no ornamentation.

## Subfamily OCNERODRILINAE.

Genus *Kerria* Bedd.*Kerria selangorensis* sp. n. (figure 8).

Batu Caves River, Selangor, F.M.S.; on banks under stones. 22. viii. 26. C. Dover. A number of specimens.

On account of the small size many of the details of anatomy could only be ascertained by means of longitudinal and transverse sections.



8

Fig. 8. *Kerria selangorensis*; spermathecae.

*External Characters.*

Length 30 mm.; diameter at clitellum 0.8 mm., further back 0.6 mm. Colour greyish. Segments 105–110.

Prostomium prolobous.

Dorsal pores absent.

The setae are paired; the ratios vary somewhat. In the anterior segments  $aa=bc=4ab$ ; in a series of transverse sections however, where the setae of a segment were well seen,  $aa$  was equal to  $\frac{1}{2}bc$ , and equal to, greater than, or less than  $3ab$ ;  $ab$  in this region  $=cd$ ; and the ventral setae are more easily visible under the binocular than the lateral. In the clitellar region  $aa$  may be considerably less than  $bc$ . Behind the clitellum  $aa$ —or is slightly less than  $bc$ , and  $=3\frac{1}{2}-4ab$ . Throughout the body  $dd$ —half the circumference.

The clitellum is saddle-shaped, the mid-ventral interruption being of relatively small extent; the ventral setae are visible. In extent the clitellum varies, both as examined under the dissecting microscope and as seen in sections; its average extent appears to be perhaps  $\frac{1}{2}xiii-xix$ ; but it fades out at both ends, so that its exact extent is difficult to define. The whole of  $xiii$  may be more or less definitely included; sometimes the anterior portion of the clitellum is only slightly developed, and it appears to end, as a well marked thickening, at the anterior third or anterior fourth of  $xiv$ ; posteriorly a part of  $xx$  may be slightly thickened.

The male area extends from the setal zone of xvi to the anterior border of xx as a rather deep and broad mid-ventral longitudinal groove, w. shelving sides, wh. takes up fully the middle two-fourths of the ventral surface. On segments xvii and xix, towards the bottom of the groove and therefore fairly near together, are the prostatic pores, forming, in specimens where they are well marked, transverse slits of some size, borne on porophores. It is difficult to estimate the exact position of the porophores in the intact animal, owing to the folding inwards of the surface to form the longitudinal trench; but in transverse sections seta *b* is seen to be internal to the centre of the papilla, the centre being occupied by the prostatic pore; seta *a* is about on the inner margin of the papilla; the prostatic pores are thus slightly external to the line of *b*. Between the papillae of the same side run the seminal grooves, almost straight but slightly irregular in their course, bounded by whitish slightly swollen margins. The male pore is exactly half-way between the prostatic pores of the same side.

Though the groove or trench seems to be usually present in fully mature worms, it is not a constant feature; its presence depends on the contraction of the oblique muscles (described w. the internal anatomy).

Setae *a* and *b* are present on segm. xviii in a specimen wh. was sectioned; here the male pores are not yet patent, but the vas deferens enters the body-wall on the outer side of seta *b*, and is developing in the body-wall in such a way as to indicate that it opens at or immediately external to the site of seta *b*.

The female pores are not visible; according to transverse sections they are in line w. the ventral setae, more particularly perhaps w. *b*.

The spermathecal apertures are in furrows 7/8, 8/9 in line w. the ventral setae.

#### *Internal Anatomy.*

I obtained different values for the thickening of the septa by dissection and by sections. In dissection 5/6 appeared slightly thickened, 6/7 moderately, 7/8, 8/9, 9/10 considerably for so small a worm; the rest were thin. In longitudinal sections 5/6 appeared moderately thickened, 6/7 and 7/8 considerably so, 8/9 moderately (equal to 5/6), 9/10 and 10/11 slightly, the rest thin. The anterior septa are attached a little in front of their corresponding grooves.

From the floor of the buccal cavity a reduplication of the epithelial lining is seen in longitudinal sections to bend forwards, reaching the mouth aperture,—even projecting a little further forwards than the lower lip, but overhung

by the prostomium. Since there is no corresponding reduplication of the dorsal wall the fold does not seem to be a mere extroversion of the buccal cavity, and may possibly have a sensory function; no muscular fibres (for retraction) enter between the two layers of the duplicature.

The dorsal pharyngeal diverticulum is of large size, and is expanded laterally so as to have in transverse section the form of a T. The chromophil cells extend back to segm. vi; a few are seen also in segm. vii.

There is a small soft gizzard in segm. vii, a little wider than the oesophagus in neighbouring segments; in sections however the thickness of the muscular layer is considerable. The intestine begins in xiii.

In segm. ix there is a pair of large elongated oesophageal sacs, pear-shaped, w. their free smaller ends anterior, attached by their broader ends ventro-laterally to the oesophagus in the hinder part of the segment; the front end extends to the anterior limit of the segment. Sections show that there is in each sac a central cavity, small and irregular in form, w. an epithelial lining of its own, in diameter not more than one-third or one-fourth of the width of the sac. In the substance of the thick wall blood-channels run longitudinally, the intervals between the channels being in general about equal to the diameter of the channels (8–12 $\mu$ ). Between the blood-channels are rows of cells, through wh. penetrate numerous small intracellular canalicules; where the blood-channels are well distended w. blood the interspaces between the channels are only large enough to accommodate a single row of cells,—hence the canalicules are necessarily intracellular. In addition to the cell rows, there are in the intervals between the blood-channels a large number of dark brown granules, resembling chloragosomes, wh. are sometimes aggregated into small masses.

Hearts are present in segms. x and xi.

The nephridia are one pair per segment. The organs seem to have lost their connection w. the septa; there seems to be no funnel projecting through the septum into the next anterior segment. Under the binocular a small tag at the ventral end of the organ seemed to represent the nephrostome, but on removing the organ and examining under the microscope there was no funnel, and the nephridial tube apparently began blindly in the tag; the tube was single,—i.e., not the blind end of a loop. The course of the tube is fairly simple, but it is covered w. a massive investment of clear peritoneal cells.

Testes and funnels are free in segm. x; in dissection I could not distinguish these organs on the right side of the segment, though those on the left were of large size; they were present on both sides in sections. Sperm morulae and

ripe spermatozoa are present floating freely in segm. x. In segm. xi are a pair of large and much and deeply lobed seminal vesicles, wh. meet in the mid-dorsal line, and may push back septum 11/12 nearly to the level of 12/13. In segm. ix, in one of the series of sections, there are masses of sperm morulae and ripe spermatozoa, wh. seem to be surrounded by an excessively delicate membrane, and so represent a second pair of much lobulated seminal vesicles.

The prostates are tubular, coiled and twisted, much elongated, extending backwards to segm. xxii, xxiii or xxiv. The coils are seen principally as masses in xx and xxi, those of the two sides united in the same mass. The diameter of the glandular tube is  $65\mu$ ; the tube takes a forward bend, and is thus in front of the level of the corresponding aperture for part of its extent; it becomes thinner ( $35\mu$ ) for a short distance near its ectal end, though it widens again ( $55\mu$ ) and becomes more muscular before penetrating the body-wall near the middle line.

Strong sheets of muscle extend obliquely upwards and outwards in the region of the male field, across the coelom on each side of the nerve cord, from near the mid-ventral line to the lateral body-wall.

The ovaries and female funnels are present in segm. xiii.

The spermathecae (fig. 9) are two pairs, in segms. viii and ix, opening in furrows 7/8 and 8/9, of relatively considerable size. In shape they are irregularly tubular, much twisted, kinked and uneven in diameter, swollen at the ental end to form an irregular sac, but without distinct separation of duct and ampulla; the sac is one-fourth or two-sevenths, or more, even a half, of the length of the whole apparatus, is very irregular in form, and does not appear to differ in the constitution of its wall from the rest. Microscopically, there are no muscular fibres in the wall of the sac; the tubular portion has a number of longitudinal fibres, wh. however do not form a complete investment. Spermatozoa are stored in the sac, but may also be present in the narrower (tubular) portion. There is no diverticulum.

There are no penial setae.

#### Remarks.

There is a considerable similarity between the present species and *K. kukenthali*, described by Michaelsen ('08) from the island of St. Thomas in the West Indies. In *K. selangorensis*, however, the clitellum extends on to segm. xiii, and is definitely saddle-shaped, while in *K. kukenthali* it is limited anteriorly to xiv, and, though developed to some extent ventrally, is still only indistinctly saddle-shaped; the spermathecae of *K. kukenthali*, too, are more regularly

shaped than those of the present form, w. a large wide ampulla, and a narrow duct fairly sharply set off, of about the same length as the ampulla. But the important distinction lies in the oesophageal sacs, wh. differ in type in the two species; in Michaelsen's species the lumen is strongly narrowed by numerous longitudinal folds, while in *K. selangorensis* there are no folds, and the contraction of the lumen is caused by the thickness of the wall w. its mass of cells and blood-channels.

Family GLOSSOSCOLECIDAE.

Subfamily GLOSSOSCOLECINAE.

Genus *Pontoscolex* Schmarda.

*Pontoscolex corethrurus* (Fr. Müll.)

Taiping Hills, F.M.S.; in termite galleries under bark of tree. 9. iii. 27. C. Dover. Several specimens, all much softened.

ADDITIONAL NOTE.

Since writing the above I have (Ann. Mag. Nat. Hist. (10) vi, 1930) published an account of a species of *Nais* (*N. bauchiensis*, from two localities in Africa) which is parasitic in the eye of a frog (*Phrynomerus*). In it, as in *N. malayana*, the dorsal setae begin in segm. iv, but it differed from the latter in having no branchial fossa. On receiving a copy of the above paper Prof. W. Michaelsen of Hamburg kindly wrote to me, suggesting several considerations, which he gave me permission to publish when opportunity offered.

Michaelsen considers that *N. malayana* and *N. bauchiensis* are related species (in virtue of the dorsal setae beginning in segm. iv in both); and that *N. malayana* is to be considered as a *Dero* by reason of the branchial chamber at the hinder end, even though there are no definite gills. It may be a question, he thinks, whether the condition in the latter worm is due to incomplete development (the specimens not being fully grown), or whether the individuals are fully developed but represent a more primitive stage in the evolution of the condition seen in typical *Deros*. *N. bauchiensis* he would (since it is closely related to *malayana*) regard as the "larval stage" of a *Dero*, with a still imperfect branchial fossa.

The above two species are next to be connected with *Dero dorsalis* Ferronière (and I would add *D. austrina* Steph.), in which also the dorsal setae begin in segm. iv, while there are normally developed gills in the branchial fossa. Perhaps in this assemblage of species we have a separate group, possibly a subgenus.

Michaelsen also brings into relation with this group "*Schmardaella*" *lutzi*, the only other endoparasitic member of the Naididae (indeed of the Oligochaeta) besides *Nais bauchiensis*. This species lives in the ureters of a South American frog of the genus *Hyla*, and was first described by Michaelsen; according to Dr. Adolph Lutz, who has further investigated it, it appears to be a *Dero*; the genus *Schmardaella*, to which it was at first referred, has no dorsal setae, but Dr. Lutz has discovered these in cultured specimens, and apparently a branchial fossa may also develop (see below).

A further connection may now lead us to the genus *Aulophorus*, distinguished from *Dero* by the hinder margin of the branchial fossa being drawn out into a pair of non-respiratory tactile palps. Thus in *Dero dorsalis* there are wartlike projections at the postero-lateral angles of the margin of the fossa; while in *D. austrina* I originally described the fossa as having prominent hinder corners, the projections being rather pointed, and appearing to be about half as long as the ventral pair of gills; these projections are thus not the finger-shaped palps of *Aulophorus*, but an initial stage in their evolution; the specimens of this worm found recently at Selangor and referred to in the present paper are similar, and I was doubtful at first whether to refer them to the genus *Dero* or to *Aulophorus*. There is also a group of species of *Aulophorus*, with fully developed palps, in which the dorsal setae begin in segm. iv or v and the dorsal needles are simply bifid and without web,—possible connections of the above group of species of *Dero*.

Dr. Michaelsen kindly sends me the following extract from a letter of Dr. Lutz on the subject of "*Schmardaella*" *lutzi*, which will be of interest for its own sake, as well as from the point of view of relationships:—

"Rio de Janeiro, 24.i.27.

. . . Meine letzte Kultur ist jetzt 20 Tage alt. Die eingesetzten Würmer bildeten nach einigen Tagen die dorsalen Bündel, je eine Haarborste und eine Gabelborste enthaltend. Ein deutlicher Branchialnapf kam nicht zu Stande; dafür bildete sich am Hinterende eine Sprossungszone aus helleren Segmenten bestehend, in denen die Chloragogenzellen nach und nach abnahmen. Heute existiert von den ursprünglichen rotgefärbten Wurmern nur eine ziemlich langes Kopfstück. Die andern sind nach und nach verschwunden. Dafür existieren weit mehr, ca. ein Dutzend junger Würmer mit zehn oder mehr Segmenten, die entweder ganz farblos sind oder nur ganz vereinzelt braunrote Chloragogenzellen aufweisen, besonders am hinteren Ende, das vertical abgestutzt, nicht abgerundet

ist. Von einem Branchialnapf ist aber nichts zu sehen; vielmehr scheint der Darm daselbst auszumünden. Die Haarborsten sind vorhanden und erreichen beide Enden ganz oder nahezu, sind aber nicht besonders deutlich, da sie selten stark abstehen. . .

gez. Dr. Adolph Lutz."

Michaelsen writes that unfortunately he cannot find the letter in which Lutz states that a sort of branchial fossa forms at the hinder end, but, if he remembers rightly, Lutz added the remark that palps are not be recognized.

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## MOUNT KINABALU: A NOTE.

In June 1928, in company with the late Mr. J. L. Humphreys, C.M.G., then Governor of British North Borneo, I made a reconnaissance of Mt. Kinabalu, the highest peak in Malaysia, to plan a collecting visit to the mountain which had been by no means exhaustively explored, though several times visited by zoologists (vide Moulton, *Journ. Sarawak Museum*, 11, 1915, pp. 136-170 and maps). The expedition was carried out in the following year, during my absence in Europe, by Messrs. H. M. Pendlebury, Systematic Entomologist, Federated Malay States Museums and F. N. Chasen, Curator, Raffles Museum, Straits Settlements. The reports on the insects will be given in this "Journal": the papers on other invertebrates and on the vertebrates in the "Bulletin of the Raffles Museum," Straits Settlements.

The accounts of the mountain fauna may profitably be compared with those of the collections made in the North Borneo lowlands by Messrs. Chasen, Pendlebury and myself in 1927 in process of publication in the journals named.

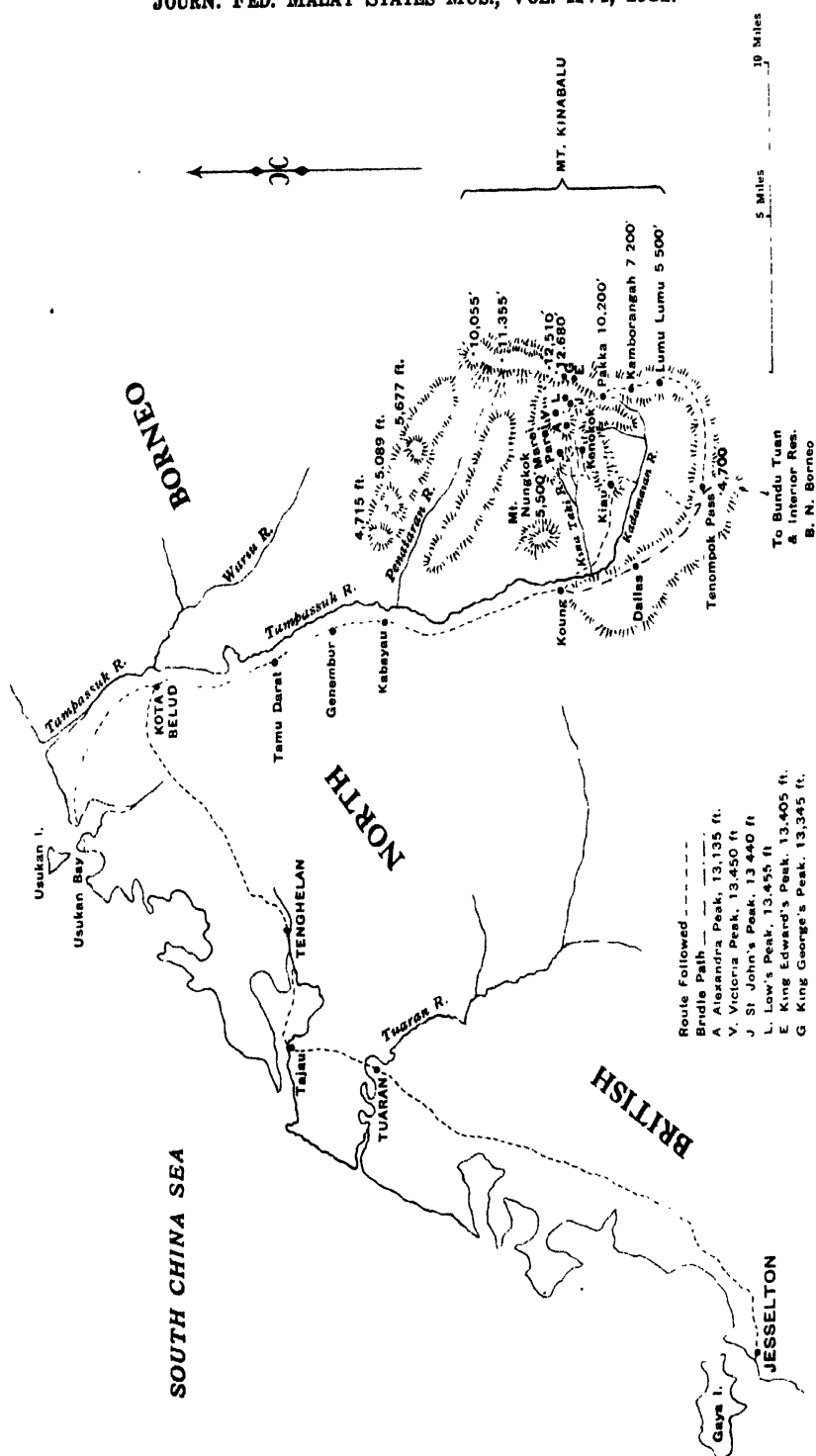
The route taken by Mr. Humphreys and myself (accompanied by Messrs. R. F. Evans and G. H. Vinen, District Officers, the former of whom made all arrangements for the journey) was a little different from that followed by the later party. Our stages, each of one day, were:—Kota Belud—Kabayau, Kabayau—Dallas, Dallas—Tenompok Pass—Bundu Tuhan, Bundu Tuhan—Tenompok Pass—Lumu Lumu—Kamborangah, Kamborangah—Pakka, Pakka—Summit—Pakka, Pakka, etc.,—Bundu Tuhan, Bundu Tuhan, etc., Kounig, Kounig—Kabayau, Kabayau—Kota Belud; *i.e.*, ten days travelling.

At Jesselton and at the various stopping places I took as many readings (always at 4 p.m.) as possible of a boiling point thermometer with the following result. In the first column each height is calculated from that of the station directly below it, in the second column the height of each station is obtained by reference to sea-level at Jesselton. The third column gives the average of the two results. Compensation for temperature has been made.

Kota Belud	-	-	-	188 ft.	188 ft.	188 ft.
Kabayau	-	-	-	590	601	596
Koung	-	-	-	1,285	1,304	1,295
Dallas	-	-	-	3,126	3,153	3,140
Bundu Tuhan (Resthouse)	-	-	-	4,016	4,067	4,042
Kamborangah	-	-	-	7,190	7,210	7,200
Pakka	-	-	-	10,195	10,226	10,211

The latest determined height of Kinabalu (that by Capt. Learmouth, of H. M. Survey-ship "Merlin," who spent five days observing at the summit in 1910) is 13,455 ft. (Low's Peak). Six peaks have heights of more than 13,000 ft.

The minimum temperature during a night spent at Kamborangah was 48F., during two nights spent at Pakka 42F.; at mid-day on the summit in beautiful weather the shade temperature was 43F. Ice is known to form at the foot of Low's Peak: Mr. R. F. Evans observed this when he spent a night on the peak some two or three years before my visit. C. Boden Kloss, *Director of Museums, Straits Settlements and Federated Malay States*.





XV.—SOME CICINDELINAE FROM MT. KINABALU,  
NORTH BORNEO, INCLUDING A NEW SPECIES.

By WALTHER HORN, *Berlin-Dahlem*.

During the visit of the Straits Settlements and Federated Malay States Museums to British North Borneo in 1929 (March—May) Mr. H. M. Pendlebury, Systematic Entomologist, F.M.S. Museums, collected the following twelve species of Tiger-Beetles on or near Mt. Kinabalu, 13,455 ft., which is the highest mountain in Malaysia.

(For an account of some Cicindelinae from the lowlands of North Borneo see Journ. F.M.S. Mus. XIV, 1929, pp. 464—468, wherein twenty-four forms are listed; three of which were described as new).

1. *Collyris diardi rufitarsis* Klug.

1 ♂ May 9th. near Kabayau alt. 600 ft. This race differs from the priority form (*diardi* Latr.) by the elytra being more regularly and more densely punctured.

2. *Therates dimidiatus punctipennis* Bates.

1 ♂ May 11th. near Kabayau alt. 600 ft. This race differs from the priority form (*dimidiatus* Dej.) by the testaceous elytra. The specimen caught by Mr. Pendlebury has the whole elytra uniformly testaceous.

3. *Therates erinus* Bates.

♂ ♀ 24th to 26th April, near Kenokok alt. 3,300 ft. and 4th. April, near Kiau 3,300 ft.

4. *Therates batesi* Thoms.

♂ ♀ 25th April, near Kenokok alt. 3,300 ft. and 8th May, near Kabayau alt. 600 ft.

5. *Therates whiteheadi* Bates.

♂ ♀ 5th to 12th April near Kiau alt. 3,000 ft. and 23rd. to 26th. April, near Kenokok 3,300 ft.

6. *Dilatotarsa tricondyloides* Gestro.

♂ ♀ 9th April, near Kiau alt. 3,000 ft. and 28th April to 2nd May, near Marei Parei alt. 5,000 ft.

7. *Heptodonta analis* F.

♂ ♀ 8th to 10th May, near Kabayau alt. 600 ft. and 3rd to 8th April, near Kiau alt. 3,000 ft.

8. *Cicindela catoptroides* W. Horn.

1 ♂ 8th May, near Kabayau alt. 600 ft.

9. *Cicindela filigera* Bates.

1 ♀ 24th April, near Kenokok alt. 3,300 ft. and 1 ♂ 8th May, near Kabayau alt. 600 ft. The specimen from

Kenokok is of a beautiful steel blue, each elytron showing two small white juxta-marginal spots, one before the apex, the other in the middle of the length of the elytra. The specimen of Kabayau is of a dirty brassy-greenish coloration showing an ante-apical spot. This species differs from the neighbouring species (*C. longipalpis* m., *C. catoptroides* m., and *C. maxillosa* m.) by the much more convex pronotum and the frons less excavated between the eyes (in its disk even just a little convex).

#### 10. *Cicindela disco-velutinosa* sp. n.

*Cicindela maxillosæ* m. similis, differt magnitudine minore; labro antice levissime aequaliterque producto; pronoto brevior, lateraliter nudo impunctatoque, solummodo angulo antico sparsim piloso; elytris totis hinc inde plagis velutinosi (visu variabili variabiliter micantibus) instructis, angula humerali ♂ ♀ subopaco vel submicante, margine apicali sat opaco, inter maculam anteapicalem et marginem opacis; pedibus gracilioribus, basali femorum parte magis clavata. 7—7½ mm. (sine labro).

1 ♂ ♀ 10th and 13th April, near Lumu Lumu alt. 5,500 ft., specimen alterum (♂) in collectione Musei F.M.S., alterum (♀) in collectione auctoris.

This new species belongs to the *filigera-longipalpis* group. The anterior margin of the greenish metallic labrum is moderately and uniformly advanced without teeth at all, laterally not sinuate as in *C. catoptroides* m., nor especially in the middle advanced as in *C. longipalpis* m., nor quite transversely truncate as in *C. maxillosa* m. The broad anterior margin of the labrum yellow. The labrum has six fine setigerous punctures, spread throughout its whole width: punctures much less deep and less crowded together than in *C. maxillosa*. The last joint of the labial palpus is almost as long and thin as the penultimate one. The pronotum is as short as in *C. longipalpis* m., but still a little flatter, the lateral margin still less rounded, without punctures near the lateral borders and almost without visible transversal striolation; shorter than in *C. maxillosa* m. and much flatter than in *C. filigera* Bat. It has only a few bristles near the anterior lateral corner. The elytra are shorter than in *C. maxillosa* m., but longer than in the other three species of this group, differing from all these four species by the dull velours-like shining lustres: seen from above, the elytra show some darkish coloration near the lateral margins, behind the base and in the middle disk, changing their reflections by looking from other directions. The humeral angle of the elytra is in ♀ ♂ half-shining (not bright); the extreme border of the apical margin shows just a slight narrow lustre, but the space between the white ante-apical spot and the margin is quite dull.

The apex of the elytra ♂ ♀ resembles very much that of *C. maxillosa* m. but the sutural spine ♀ is much less bent to the opposite side, crossing each other much less. The legs are at least as long and thin as in *C. catoptroides* m.; the basal half of the femora at least as clavate as in this last species: they are longer, thinner and much more clavate than in *C. longipalpis* and *filigera*. The basal half of the six femora is sparingly and moderately long setose; the apical half is almost without bristles; there are hardly any traces of hooked bristles anywhere. The disk of the abdomen densely pubescent. The ♀ elytra have a small rounded bright mirror in their anterior half, a little nearer the suture than the outer margin as in *C. catoptroides*; (not reaching the suture as always in *C. longipalpis* m. and often in *C. maxillosa* m.). The apex of the penis as in *C. catoptroides*, which means the narrowed apical part very long, the extreme apex just a little bent, imitating something like a onesided enlargement (*C. maxillosa* m. has the narrowed part much shorter and shows—as also *C. longipalpis* does—the extreme end much more bent, imitating more something like a slight hook).

The whole coloration of the body, the first article of the antennae and the proximal half of the femora are olivaceous greenish, only the middle frons, vertex, disk and anterior border of the pronotum and greater parts of the elytra are darker greenish, becoming here and there even greenish blackish. The second to fourth joints of the antennae, the distal half of the femora and the tibiae are of violaceous coloration, the tarsi are cyaneous.—The position of the new species has to be between *C. maxillosa* m. and *catoptroides* subsp. *gestroi* m.

11. *Cicindela discreta* Schaum.

1 ♂ 9th May near Kabayau alt. 600 ft.

12. *Cicindela aurulenta*.

1 ♂ 9th May near Kabayau alt. 600 ft. and 1 ♂ 31st March, near Kiau alt. 3,000 ft.

## XVI.—ADDITIONAL RECORDS AND DESCRIPTIONS OF SYRPHIDÆ FROM THE MALAY PENINSULA

By C. H. CURRAN

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In my previous report on the *Syrphidæ* of the Malay Peninsula\* I presented descriptions of all the species of which I had representatives. In that report the specimens collected during the years 1921–25 were dealt with. The present contribution is based upon the collections made since that time, up to early January of the present year (1930). Many species new to the region are at hand and the range of forms previously recorded from a single area is increased as a result of the study of the further excellent collection made by Mr. H. M. Pendlebury, Systematic Entomologist, Federated Malay States Museums.

I have found a few typographical errors in the original paper and these, where important, are noted in the text. Some inaccuracies have also come to light, some new synonymy is suggested. Where additional species belonging to a genus are represented in the collection new keys are presented in order to simplify the identification of material. In what is really a second part of this report, dealing with two collections from British North Borneo, are descriptions of many new species: these are included in the keys. In addition to these a few specimens from Siam, contained in the collection of the American Museum of Natural History, are also recorded. In pursuance of the policy of the Federated Malay States Museums, the types of new species will be deposited in the British Museum of Natural History, while, wherever material permits, paratypes are retained in the collection of the American Museum of Natural History.

The arrangement follows that of my previous paper. The acquisition of several genera of which I have not previously had representatives enables me to present what appears to be a much more satisfactory generic synopsis.

I must once more express my thanks to Mr. H. M. Pendlebury for the pleasure it has given me to examine and report upon the collection. Also to Mr. C. Boden Kloss, Director of the Straits Settlements and Federated Malay States Museums, with whom Mr. Pendlebury made the first collection from Borneo and whose direction of the Museums is resulting in the acquisition and maintenance in Malaya of extensive faunal collections.

\* Journ. F.M.S. Mus., XIV, 1928, pp. 141–324.

## Synopsis of Genera.

- 1 (2). Anterior crossvein terminating considerably before the middle of the discal cell - - - 2.  
 Anterior crossvein joining the fourth vein at or beyond the middle of the discal cell, usually oblique - - - 43.
- 2 (1). Arista apical - - - 3.  
 Arista dorsal - - - 4.
- 3 (2). Eyes pilose; abdomen oval - - - *Callicera* Meigen.  
 Eyes bare, abdomen slender - - - *Pelecocera* Meigen.
- 4 (2). Humeri pilose, at least on the posterior part - 5.  
 Humeri entirely bare - 26.
- 5 (4). Face never tuberculate, concave between the antennal base and tip of oral margin which is usually more or less produced - - - 6.  
 Face either tuberculate, strongly produced downward, practically perpendicular or convex - - - 9.
- 6 (5). Epistoma produced forward into a long snout, abdomen broadly oval - *Rhingia* Scopoli.  
 Epistoma not unusually produced; abdomen slender - - - 7.
- 7 (6). Third antennal segment orbicular, rather large, rarely oval; arista longer than antenna - *Sphegina* Meigen.  
 Third antennal segment elongate-oval - - - 8.
- 8 (7). Face everywhere more prominent than the antennal base - - - *Rhinobaccha* de Meijere.



- Face concave and, at  
some point, less pro-  
minent than the anten-  
nal base - - - *Neoascia* Williston.
- 9 (5). Marginal cell closed - 10.  
Marginal cell open - - 11.
- 10 (9). Arista plumose - - *Volucella* Geoffroy.  
Arista bare (*Eristalinæ*) - *Dissoptera* Edwards.
- 11 (9). Arista plumose - - 12.  
Arista bare or short  
pubescent - - - 16.
- 12 (11). Face wholly black (or  
with small yellow spot  
on the sides below) and  
with strongly differ-  
entiated lateral mar-  
gins (subgenus *En-  
doiasimyia* Bigot) - *Cheilosia* Meigen.
- Face yellowish, often with  
median black vitta, the  
side margins obsolete  
above and at most  
poorly differentiated - 13.
- 13 (12). Posterior coxæ bare be-  
hind; apical cross-vein  
oblique - - - 14.
- Posterior coxæ pilose be-  
hind; apical cross-vein  
at right angle to fourth  
vein - - - *Graptomyza*  
Wiedeman.
- 14 (13). Abdominal pile short, not  
abundant, not conceal-  
ing the ground color  
from any view - - 15.
- Abdominal pile abundant  
and moderately long  
concealing the ground  
color from anterior or  
lateral view - - *Arctophila* Schiner.
- 15 (14). Head very short - - *Pseudovolucella*  
Shiraki.
- Head somewhat shorten-  
ed but not strikingly  
so - - - *Sericomyia* Meigen.
- 16 (11). Face convex in profile,  
never tuberculate - 17.

- Face not convex, usually  
tuberculate or the oral  
margin more or less  
projecting - - - 18.
- 17 (16). Posterior coxæ bare be-  
hind - - - - *Mixogaster* Macquart.  
Posterior coxæ pilose  
behind - - - - *Microdon* Meigen.
- 18 (16). Face or front with trans-  
verse wrinkles - - - 19.  
Face and front without  
transverse wrinkles - 20.
- 19 (18). Third antennal segment  
elongate - - - *Orthoneura* Macquart.  
Third antennal segment  
little longer than  
broad - - - *Chrysogaster* Meigen.
- 20 (18). Abdomen spatulate; hu-  
meri hairy only on the  
posterior border (sub-  
genus *Allobaccha* Cur-  
ran) - - - - *Baccha* Fabricius.  
Abdomen rarely spatul-  
ate, the humeri more  
than half haired - - 21.
- 21 (20). Abdomen oval or elongate  
oval, not unusually  
long; face almost al-  
ways wholly black in  
ground color - - 22.  
Abdomen twice as long as  
thorax, somewhat nar-  
rowed sub-basally;  
arista near middle of  
third antennal seg-  
ment - - - *Spheginobaccha* de  
Meijere.
- 22 (21). Face tuberculate - .. 23.  
Face without tubercle - 24.
- 23 (22). Eyes bare - - - *Cartosyrphus* Bigot.  
Eyes pilose - - - *Cheilosia* Meigen.
- 24 (22). Oral margin conspicuous-  
ly produced - - - *Psilota* Meigen.  
Oral margin scarcely  
produced - - - 25.

- 25 (24). Face widening below - *Pipiza* Meigen.  
 Face slightly narrowed below - - - *Pipizella* Rondani.
- 26 (4). Abdomen more or less spatulate, the second segment cylindrical on most of its length - - *Baccha* Fabricius.  
 Abdomen not spatulate, never conspicuously narrowed toward the base - - - 27.
- 27 (26). Face and scutellum wholly black - - - 28.  
 Face or scutellum or both partly pale in ground color - - - 30.
- 28 (27). Abdomen broad, elliptical, flat - - - *Xanthandrus* Verrall.  
 Abdomen narrower than the thorax, with almost parallel sides in male - 29.
- 29 (28). Anterior tarsi or tibiae or both, in ♂, more or less strongly broadened - - - *Platycheirus* St.  
 Fargeau et Serville.  
 Legs simple - - - *Melanostoma* Schiner.
- 30 (27). Antennae very long, porrect; wasp-like species - *Chrysotoxum* Meigen.  
 Antennae shorter, not porrect, usually not wasp-like in appearance - - - 31.
- 31 (30). Sides of the mesonotum bright yellow in ground color - - - 32.  
 Sides of the mesonotum at most obscurely yellowish - - - 35.
- 32 (30). Face strongly produced forward and with a well marked, long, nasal form tubercle - - *Sphærophoria* St.  
 Fargeau et Serville.  
 Face at most moderately produced, usually with a very low or broad tubercle - - - 33.

- 33 (32). Abdomen mostly opaque;  
facial tubercle not  
strong, broad and low - *Syrphus* Fabricius pt.  
Abdomen with broad  
shining black and yellow  
bands or spots - 34.
- 34 (33). Third antennal segment  
swollen, elongate and  
cylindrical - - - *Ischiodon* Sack.  
Third antennal segment  
laterally compressed,  
obtusely rounded apically,  
not elongate - *Sphærophoria* St.  
Fargeau et Serville.
- 35 (31). Eyes pilose - - - 36.  
Eyes bare - - - 40.
- 36 (35). Abdomen and thorax  
with abundant, long  
pile, the face produced  
strongly downward - *Eriozona* Schiner.  
Without both these characters  
- - - 37.
- 37 (36). Quite small species,  
the abdomen normally  
drooping; antennæ rather  
elongate - - - *Paragus* Latreille.  
Species more than 7 mm.  
in length, the abdomen  
never drooping - - - 38.
- 38 (37). Abdomen not margined,  
the sides curled under - *Ischyrosyrphus* Bigot.  
Abdomen with raised  
margins at the sides - 39.
- 39 (38). Abdomen with pale fasciæ  
or paired spots - *Syrphus* Fabricius.  
Abdomen black on basal  
half, reddish on apical  
half - - - *Malayomyia* Curran.
- 40 (35). Wings pure hyaline, entirely  
without microscopic hairs - - *Scaeva* Fabricius.  
Wings villous on most of  
surface - - - 41.
- 41 (40). Oral opening narrow; abdomen  
shining, broader than the thorax  
and usually flat - - *Asarkina* Macquart.

- Oral opening oval; abdomen largely opaque - 42.
- 42 (41). Abdomen very broad and flat, the very broad pale fasciæ usually with green tinge - - *Didea* Macquart.
- Abdomen but little broader than the thorax, often narrow, always more pointed apically - *Syrphus* Fabricius.
- 43 (1). Antennæ with a terminal style - - - *Ceriodes* Rondani.
- Antennæ with dorsal arista - - - 44.
- 44 (43). Each femur at base of under surface with a dense patch of setulæ which are usually black; third vein usually strongly looped into apical cell - - - 53.
- Only the posterior femora with such setulæ; third vein only gently looped into apical cell - 45.
- 45 (44). Marginal cell open - - 46.
- Marginal cell closed and petiolate - - - *Milesia* Latreille.
- 46 (45). Apical crossvein strongly recurrent - - - *Eumerus* Meigen.
- Apical crossvein at most weakly recurrent just at its apex - - - 47.
- 47 (46). Face produced downward and forward into a long, sharp snout - *Lycastris* Walker.
- Face not sharply produced - - - 48.
- 48 (47). Arista bare - - - 49.
- Arista plumose (see couplet 14). - -
- 49 (48). Pile very long and abundant; (resembling bumble bees) - - *Criorhina* Meigen.
- Pile short or of moderate length; (resembling wasps or other bees) - 50.

- 50 (49). Mesonotum with bright  
yellow pollinose spots  
in addition to those on  
the humeri - - *Temnostoma* St.  
Fargeau et Serville.
- Mesonotum at most  
weakly pollinose other  
than on the humeri - 51.
- 51 (50). Pile abundant and mode-  
rately long - - *Brachypalpus*  
Macquart.
- Pile short and usually  
inconspicuous - - 52.
- 52 (51). Face rather carinate;  
oral margin not strong-  
ly produced; posterior  
femora very greatly  
swollen - - - *Syritta* St. Fargeau et  
Serville.
- Face concave; posterior  
femora rarely greatly  
swollen - - - *Xylota* Meigen.
- 53 (43). Marginal cell open - - 54.
- Marginal cell closed - 57.
- 54 (53). Posterior femora with a  
triangular projection  
below before the apex - *Merodon* Meigen.
- Posterior femora normal,  
sometimes with a low  
ridge on apical third of  
lower edges - - 55.
- 55 (54). Apical crossvein strong-  
ly recurrent - - *Azpeytia* Walker.
- Apical crossvein at most  
slightly recurrent - 56.
- 56 (55). Face at most obscurely  
tuberculate - - *Mesembrius* Rondani.
- Face with strong tuber-  
cle - - - 57.
- 57 (56). Scutellum yellowish - 58.
- Scutellum shining black - *Klossia* gen. n.
- 58 (57). Posterior femora with a  
distinct ridge on more  
than the apical third - *Tigridimyia* Bigot.
- Posterior femora with  
only slight preapical  
swelling - - - *Mallota* Meigen.

- 59 (53). Eyes pilose, at least on upper half - - - 58.  
 Eyes bare - - - 62.
- 60 (59). Eyes unicolorous or practically so - - - *Eristalis* Latreille.  
 Eyes spotted or striped - 61.
- 61 (60). Eyes with vertical brown stripes - - - *Eristaloides* Rondani.  
 Eyes with numerous round spots, often many of them confluent - - - *Lathyrrophthalmus* Mik.
- 62 (59). Mesonotum vittate with black and gray or yellow - - - 63.  
 Mesonotum not vittate - 64.
- 63 (62). Face not tuberculate, the oral margin the most prominent - - - *Keda* gen. n.  
 Face tuberculate, the tubercle the most prominent - - - *Merodonoides* gen. n.
- 64 (62). Posterior femora with a strong triangular subapical tooth below near the apex - - - *Dolichomerus* Macquart.  
 Posterior femora without such tooth - - - 65.
- 65 (64). Mesonotum distinctly broader than long; head very large - - - *Megaspis* Macquart.  
 Mesonotum not as broad as long; head normal in size - - - 66.
- 66 (65). Mesonotum almost bare, the hair extremely short - - - *Axona* Walker.  
 Mesonotum with more or less conspicuous pile - 67.
- 67 (66). Loop of third vein more or less recurrent anteriorly; abdomen elongate - - - *Korinchia* Edwards.  
 Loop of third vein oblique apically, never quite transverse; abdomen broader, more oval and more tapering - - - *Eristalis* Latreille.

## CERIOIDINAE

Genus *Cerioides* Rondani.

The collections contain three species, one from Borneo. The genus was not represented in previous collections although it was known to occur in the Malay Region.

## Table of Species.

- |  |         |                              |
|--|---------|------------------------------|
| 1. Mesonotum without a yellow vitta or spot above the wings                          | - - - - | 2.                           |
| Mesonotum with a yellow vitta above the wings  | - -     | <i>trinotata</i> de Meijere. |
| 2. Scutellum yellow with the median third black, the spots of practically equal size | - - - - | 3.                           |
| Scutellum black with the free border wholly yellow                                   | -       | <i>siamensis</i> sp. n.      |
| 3. Squamæ brown with whitish border  | - - - - | <i>javana</i> Wiedemann.     |
| Squamæ white   | - - -   | <i>anchorata</i> Bigot.      |

*Cerioides trinotata* de Meijere.

Two ♂, Kedah Peak, 3,950 ft., March 23, 1928 (H. M. Pendlebury).

One of these specimens shows only a part of the yellow triangle on the posterior border of the mesonotum while the other shows no trace of it. Nevertheless I believe that they are referable to this species.

*Cerioides siamensis* sp. n.

Evidently related to *triangulifera* Brunetti but the cheeks are wholly black in ground color. Length, about 13 mm.

*Female*. No antennal pedicel, but the frontal prominence is produced forward so as to overlap the base of the antennæ. Head black in ground color, the sides of the face very broadly yellow, the yellow produced inwards above as a large, orbicular spot which greatly narrows the black and leaves it in the form of a triangle; front below with a large transverse yellow triangle on either side which is narrowly separated from the yellow of the face along the orbits. Frontal depressions sub-triangular, coarsely punctured, leaving a broad median ridge; sides of front yellow pubescent below the ocelli. Posterior orbits and vertex brassy yellow pollinose, behind the upper angles of the eyes a small, brown spot. Pile short, whitish, very short and fine on the face and lower half of the front.



Antennæ blackish, the basal half of the basal segment brownish-red; third segment short and tapering, half as long as the second, the second five-sixths as long as the first; style yellowish.

Mesonotum black, finely scrobiculate; humeri and notopleura yellow; pile very short, brownish-yellow. Pleura black; the posterior half of the mesopleura and a large, subcontiguous spot on the sternopleura, yellow; pile whitish. Scutellum black, the free border broadly yellow, the pile as on the mesonotum.

Anterior femora yellow on basal third, ferruginous apically, the under surface black on apical two-thirds; tibiae and tarsi rusty brownish-red. Middle femora yellow on basal half, rusty reddish apically, the under surface black on the whole length. Middle tibiae and tarsi, brownish-red, the apical segment blackish. Basal fourth of posterior femora yellow except ventrally, the apical third brownish-red, the rest black; posterior tibiae and tarsi somewhat paler than the middle pair, the apical two or three segments black or brown.

Wings cinereous hyaline, brown in front of the third vein. Squamæ white. Halteres yellow.

Abdomen black, with very short appressed pile. First segment with a yellow spot on either side. Apices of second to fourth segments rather broadly reddish-yellow. Second segment slender, longer than the third, widened at base and apically, its sides broadly ferruginous except on the apical fourth. Fourth segment with a very large triangle of brownish-yellow pollen which is coarsely punctulate and conspicuous only in some views.

Described from one specimen from Nan, Siam, Dec. 30, (T. D. A. Cockerell) in American Museum of Natural History.

#### MICRODONTINAE

##### Genus *Microdon* Meigen.

The following key includes the species which I have been able to place from Malaya and Borneo.

#### Table of Species.

- |   |   |   |     |
|---|---|---|-----|
| 1. Scutellum with spines  | - | - | 2.  |
| Scutellum without spines  | - | - | 10. |
| 2. Scutellar spines closer together than the length of the scutellum which is about as long as wide | - | - | 3.  |

- Scutellum almost or quite  
twice as wide as long its  
apex gently concave be-  
tween the spines which  
are situated on the cor-  
ners - - - - 5.
3. Wings hyaline or nearly so,  
or the crossveins cloud-  
ed - - - - 4.
- Wings blackish and brownish  
in front and apically - *robinsoni* Curran.
4. Antennæ longer than head - 19.  
Antennæ shorter than head - *minuticornis* sp. n.
5. Face wholly yellow pilose - 7.  
Face largely or wholly black  
pilose - - - - 6.
6. Face wholly black pilose - *lativentris* de Meijere.  
Face yellow pilose laterally;  
wings pale yellow in  
front - - - - *grandis* Curran.
7. Mesonotum and abdomen  
wholly golden yellow  
pilose - - - - *æneoviridis* sp. n.  
Mesonotum and abdomen  
largely black pilose - 8.
8. Abdomen with white or yel-  
low pilose areas - - - 9.  
Abdomen wholly black pilose - *stilboides* Walker.
9. Anterior four tibiæ and the  
scutellum white haired - *alboscutatus* sp. n.  
Tibiæ and scutellum black  
haired - - - - *latiscutellaris* sp. n.
10. Color blackish or partly red-  
dish - - - - 11.  
Color metallic bluish - - - *sumatranus* Wulp.
11. Abdomen not or but little  
reddish on the sides - 13.  
Abdomen partly reddish or  
yellow on the second and  
third segments - - - 12.
12. Antennæ very short, not  
longer than the head;  
scutellum emarginate api-  
cally and with erect pile - *minuticornis* sp. n.  
Antennæ very long; scutel-  
lum evenly rounded  
apically and with ap-  
pressed pile - - - 18.

13. Apical fourth of the wings  
brown - - - - *wulpi* Mik.  
Wings not contrastingly  
brown apically - - *auroscutatus* Curran.
14. Wings black basally, pale  
orange on more than the  
apical half - - - *pretiosa* sp. n.  
Wings differently colored - 15.
15. Wings rather whitish, with  
yellow veins and brown  
apex - - - - *pendleburyi* sp. n.  
Wings differently colored, (if  
spotted apically the veins  
are brown) - - - 16.
16. First antennal segment hairy - 17.  
First antennal segment bare - 20.
17. Legs wholly brownish-yellow;  
wings uniformly brown-  
ish tinged - - - *fulvipes* de Meijere.  
Legs black; wings deep  
brown in front, paler  
brown behind - - *stenogaster* sp. n.
18. Apical fourth of the wings  
brown and sharply con-  
trasting with the basal  
part - - - - *wulpi* Mik.  
Wings much more evenly  
colored - - - - *auriscutatus*  
*variventris* Curran.
19. Abdomen narrowest at second  
segment - - - *luxor* sp. n.  
Abdomen widest at second  
segment - - - 20.
20. Mesonotum with transverse  
brassy yellow fasciæ - *klossi* sp. n.  
Mesonotum with unicolorous  
pile - - - - *trimacula* Curran.

***Microdon aeneoviridis* sp. n.**

A very robust species with very narrow front and short, rectangular scutellum, differing from *stilboides* Walker and *grandis* Curran by the color of the pile. Length, 14 mm.

*Male.* Head green, sides of front and narrow posterior orbits with cyaneous reflections. Pile black, on the face and the occiput below the neck brassy-yellow. Front strongly narrowed at lowest third, the ocellar triangle longer than wide, situated far before the posterior angles of the eyes. Face gently convex, more strongly so below.

Eyes with sparse, short white pile. Antennæ much longer than the head, black, the first and third segments of equal length, the second two-sevenths as long. Face narrow, somewhat narrowed below.

Mesonotum and scutellum green, the former with five brassy vittæ, the latter mostly brassy, the pile moderately short and brassy-red. Pleura black pilose.

Legs deep blue, black pilose, the posterior tarsi slightly swollen.

Wings with brownish tinge, somewhat darker along the veins, the venation much as in *grandis*. Squamæ white with rusty brownish fringe, the upper lobe brownish.

Abdomen bronze-green, with abundant rather short brassy reddish pile. Basal three sternites green, mostly black haired, the fourth sternite and genitalia reddish.

Holotype, ♂, Kedah Peak, 1,000 to 2,000 feet, March 7, 1928 (H. M. Pendlebury).

#### ***Microdon alboscutatus* sp. n.**

Cyaneous, the abdomen with three pairs of large, white pilose spots. Resembles *sumatranus* but with a short, broad scutellum and short, sparse, cinereous pile on the eyes. Length, 12 mm.

*Male*. Head bluish, the face green; pile white, on the front yellow. Front narrow, narrowed to the anterior third where the transverse groove is deep; ocellar triangle equilateral, situated well before the posterior angles of the eyes. Face almost perpendicular, convex below. Antennæ black, very long, the third segment six-sevenths as long as the first, the second one-fifth as long as the third; arista brown, shorter than the third segment.

Pile of the thorax fairly long, in front of the suture rather golden and there are a few golden hairs above the roots of the wings, behind the suture and on the pleura the pile is black but below the humeri it is whitish. The scutellum bears white pile and the pilose spines are situated at the posterior corners, the apex transverse but distinctly concave dorsally, the width of the scutellum equal to about twice its length.

Legs black, with bluish reflections, the pile black; anterior four tibiæ and basal half of the posterior pair on upper half, with abundant, silvery-white pile. The pile on the tarsi is short and appressed, the first segment of the posterior pair strongly swollen.

Wings blackish, paler posteriorly, subbasally with a broad, incomplete hyaline fascia; apical crossvein very slightly recurrent, with a short appendage projecting into the apical cell from the middle. Squamæ white. Halteres yellow with black knob.

Abdomen with appressed, rather short pile, the first and second segments each with a white pilose spot towards either side, the second with another lateral spot outside the first-mentioned one; third segment on either side with an oblique, subtriangular white pilose spot which tapers posteriorly and connects with the inner spots on the preceding segment; fourth segment laterally with a large, oblique-transverse spot anteriorly which connects with a smaller spot on the third segment towards the middle, and on either side posteriorly with an elongate oval, longitudinally situated white pilose spot. In some lights these spots appear silvery. Venter darker, with violaceous reflections, the pile black. Genitalia blackish.

*Female.* Front wider, widening slightly on the anterior third, wholly whitish pilose. Mesonotal pile very pale yellow, almost whitish. Fifth abdominal segment with white pilose triangle on the basal corner.

Holotype, ♂, Malay Peninsula, West Coast, Langkawi Island, April 19, 1928 (H. M. Pendlebury). Allotype, ♀, Siam.

*Microdon pretiosa* sp. n.

Wings black on almost the basal half, pale orange on apical half, head and apical abdominal segment deep golden pilose. Length, 12 to 13 mm.

*Male.* Head black, golden pilose, some black hairs behind the vertex, the cheeks and lower part of the occiput pale yellow pilose. Face gently receding, moderately convex below. Upper three-fifths of the front with almost parallel sides and very little wider than long. The ocellar triangle is of moderate size, slightly wider than long and situated distinctly in front of the posterior corners of the eyes. Antennæ elongate, the first segment reddish, exactly as long as the two following combined, which are reddish-brown, the second segment two-fifths as long as the third; arista reddish, shorter than third segment.

Thorax black, in front of the suture, the mesopleura, upper part of the sternopleura and the sides of the mesonotum behind the suture, short golden pilose, the dorsum otherwise black haired, the pleura bare.

Legs reddish, the basal third of the anterior, half of the middle and whole of the posterior femora and the posterior tibiæ, black; hair very short, black, on the tarsi golden; the ventral surface of the anterior four tibiæ and the posterior pair on the apical fourth of under surface, reddish golden pilose. Posterior tarsi strongly widened, tapering to their apices.

The extent of the black color of the wings varies according to the angle from which viewed sometimes

appearing to occupy little more than the basal third of the wing. The crossveins closing the apical and discal cells are slightly recurrent, very broadly rounded posteriorly and without appendages. Squamæ black.

Abdomen black, with very short appressed black pile, the apical segment deep golden pilose, as long as the basal three combined, in the middle with a narrow wedge of black pile extending from the base almost to the apex; sides of third segment with a weak, oblique patch of golden pile. Venter black and black pilose, the tip of the fourth sternite and the genitalia reddish and reddish or golden pilose.

Holotype, ♂, Malay Peninsula, West Coast, Langkawi Islands, April 16, 1928, (H. M. Pendlebury). Paratype, ♂, same data, April 15, in American Museum of Natural History.

[This species bears a superficial resemblance to the wasp: *Odynerus (Rygchium) hæmorrhoidale* Fabr., which is common on Langkawi Islands, H. M. P.]

**Microdon auroscutatus** Curran.

Journ. F.M.S. Mus., XIV, 152, 1928.

♂, Selangor, Kuala Lumpur, 15th mile Kanching, Jan. 14, 1930, (H. M. Pendlebury).

**Microdon auroscutatus variventris** Curran.

Journ. F.M.S. Mus., XIV, 154, 1928.

♂, Kedah, Catchment Area, near Jitra, April 11, 1928, (H. M. Pendlebury).

**Microdon pendleburyi** sp. n.

Black, sides of second abdominal segment and legs in part, reddish; wings whitish with brown apical spot, the veins yellow. Length, 15 mm.

*Female*. Head black, the facial depressions very broad, triangular, reddish; pile very short, whitish with brassy sheen, the front with black pile, below the middle with a shallow depression resting on either orbit below which the pile is pale; no distinct transverse groove. Ocellar triangle swollen, prominent, longer than wide, situated in front of the posterior angle of the eyes. Face perpendicular above, convexly receding below. Antennæ blackish, the first segment reddish basally, equal in length to the third segment, the second segment two-sevenths as long as the third; arista slender, two-thirds as long as third segment, reddish basally.

Mesonotum black, with extremely short black pile, the sides broadly and a posterior band rusty reddish; pleura and scutellum ferruginous or brownish-red, the mesopleura and base of the scutellum blackish, the pleura with white, the scutellum with rusty reddish pile.

Coxæ and trochanters black; femora reddish, the anterior four black posteriorly; tibiæ reddish, largely black anteriorly; tarsi brownish-red. Pile extremely short, appressed, white and silvery in some views, becoming yellow on the apices of the tarsi.

Wings with the veins on the apical fifth broadly clouded with brown, the apical and discal crossveins somewhat recurrent. Squamæ whitish with broad brownish margins. Halteres whitish.

Abdomen black, the sides of the second segment broadly and the narrow lateral margins of the following segments reddish; pile extremely short, black, on the first segment white, on the sides of the third and following segments brassy or golden, the pale pile extending inwardly along the sutures, while there are scattered brassy hairs laterally on the fourth segment as well as on its apical fourth. On the second segment the pile appears whitish in some views or brownish or yellowish on the disc. Ventral incisures more or less reddish, the pile yellowish, white on the basal two sternites.

Holotype, ♀, Kedah Peak, 3,000 to 3,500 ft., March 15, 1928, (H. M. Pendlebury).

***Microdon luxor* sp. n.**

An elongate, slender species, the abdomen narrowest at the second segment, widest at the apex of the third. Black, the second abdominal segment mostly yellow; tibiæ and tarsi yellow. Length, about 7.5 mm.

*Male.* The head has been wet and it is not possible to determine the color of any pollen which might have been present. Front wide, gently widened at the vertex, with short, pale brassy yellow hair except around the ocellar triangle; ocellar triangle small, wider than long, situated slightly in front of the posterior angles of the eyes. Face slightly narrowing below, pale brassy yellow pilose; but little retreating and gently convex. Pile of the occiput whitish. Antennæ black, longer than the head, the first segment bare, as long as the apical two combined; third segment three times as long as the second; arista brownish red, slender.

Mesonotum with very short black hair; with a broad posterior fascia and triangles at the outer end of the suture brassy yellow pilose, the pleura with a broad band of similar pile across the middle. Scutellum black, with short, sub-appressed brown pile and small, rather approximated spines.

Femora shining blackish, the apices of the anterior (four?) broadly reddish-yellow, the hair very short and black. Tibiæ reddish-yellow, bright yellow pilose, the pos-

terior pair brown and brown pilose on the apical three-fifths. Tarsi wholly pale and pale pilose. The anterior legs are missing but are probably similar in color to the middle pair.

Wings cinereous hyaline, tinged with brown along the apical border. Apical crossvein transverse, with a short appendage behind. Discal crossvein recurrent, convex on posterior two-thirds. Squamæ and their fringes brownish. Halteres reddish-yellow.

First abdominal segment shining black, with a large, low, median swelling. Second segment narrow, mostly yellow, the lateral margins narrowly and the posterior border broadly black, the posterior black fascia emitting a slender brownish triangle which runs half through the yellow spot. Third and fourth segments fused, the fourth broadly reddish apically. Pile very short, appressed, black; a broad, oblique band extending from the sides of the fourth segment well onto the third medianly and a very large triangle on either side of the fourth segment apically, brassy yellow. The black triangles on the fourth segment are moderately separated from each other. The pile on the first segment is erect and yellowish laterally. There appears to be a small basal triangle of brassy-yellow pile on the anterior angles of the third segment and this may extend slightly onto the second. Genitalia reddish; second sternite yellow.

♂, Selangor, Bukit Kutu, 3,500 ft., April 20, 1926 (H. M. Pendlebury).

#### VOLUCELLINAE

##### Genus *Graptomyza* Wiedemann.

The present collection contains one species, *longirostris* Wiedemann, not previously seen by me from Malaya.

##### Table of Species.

- |   |         |                                |
|---|---------|--------------------------------|
| 1. Legs practically all black   | -       | <i>seimundi</i> Curran.        |
| Legs extensively reddish or yellow  | - - - - | 2.                             |
| 2. Posterior femora black or brown only on apical third or less           | - - - - | <i>brevirostris</i> Wiedemann. |
| Posterior femora wholly reddish or at least with the apical third reddish | -       | 3.                             |
| 3. Abdomen with longitudinal pale markings                                | - -     | <i>longirostris</i> Wiedemann. |
| Abdomen with transverse pale markings                                     | - - -   | <i>ventralis</i> Wiedemann.    |



**Graptomyza seimundi** Curran.

Journ. F.M.S., xiv, 170, 1928.

♀, Kedah Peak, 3,900 ft., March 28, 1928 (H. M. Pendlebury).

**Graptomyza ventralis** Wiedemann.

Ausser. Zweifl., ii, 207, 1830.

♀, Selangor, Bukit Kutu, 3,500 ft., April 20, 1926 (H. M. Pendlebury).

**Graptomyza brevirostris** Wiedemann.

Ausser. Zweifl., ii, 209, 1830.

♀, Kedah Peak, 3,300 ft., March 23, 1928, (H. M. Pendlebury).

**Graptomyza longirostris** Wiedemann.

Nova Dipt. Gen., 16, 1820; Ausser. Zweifl., ii, 208, 1830.

♂ ♀, Kedah Peak, 3,000 and 3,300 ft., March 18, 19, 1928; ♂, Kuala Lumpur, Dusun Tua, Jan. 12, 1930; 2 ♀, Kuala Lumpur, one on window, May 5 and Oct. 26, 1926, (H. M. Pendlebury).

## MILESINAE

Genus *Milesia* Latreille.

## Table of Species.

- |  |                            |
|--|----------------------------|
| 1. Face black in ground color -  | <i>balteata</i> Kertesz.   |
| Face yellow or orange in ground color - - -  | 2.                         |
| 2. A yellow pollinose fascia immediately in front of the scutellum - - -                           | 3.                         |
| No prescutellar fascia - - -   | 6.                         |
| 3. Abdominal segments each with a single, interrupted yellowish fascia - - -                       | 4.                         |
| Segments each with two pale fasciæ - - - -   | 5.                         |
| 4. A pair of median yellow vittæ on the anterior three-fourths of the mesonotum -                  | <i>conspicua</i> Curran.   |
| No such vittæ, the interrupted pollinose fasciæ not connected - - - -                              | <i>insistens</i> sp. n.    |
| 5. Anterior yellow fascia on abdominal segments, normally interrupted, the black fasciæ linear - - | <i>sinensis</i> Curran.    |
| Both fasciæ on abdominal segments entire, the black fasciæ broad - - -                             | <i>pendleburyi</i> Curran. |

6. Thorax brownish-red - - *gigas* Macquart.  
 Thorax blackish - - - 7.
7. Notopleura bright yellow in  
 ground color - - - *tenuiformis* Curran.  
 Notopleura not yellow in  
 ground color - - - 8.
8. Abdomen with at least one  
 yellowish fascia - - 9.  
 Abdomen without yellow  
 fasciæ - - - *metallica* sp. n.
9. Wings almost evenly colored;  
 abdomen with two yellow  
 fasciæ - - - *excelsa* Curran.  
 Wings tricolored; abdomen  
 with four yellow bands - *callida* Curran.

***Milesia balteata* Kertesz.**

Three ♂ ♀, Kedah Peak, 3,000—3,500 ft., March 9, 15, 19 and 23, 1928, (H. M. Pendlebury).

The female has only short pile on the legs and the front is wholly shining black.

***Milesia gigas* Macquart.**

Hist. Nat. Dipt. i, 533, 1834.

♀, Malay Peninsula, West Coast, Langkawi Islands, April 23, 1928, (H. M. Pendlebury).

The female has the legs rather slender and without long hair.

***Milesia pendleburyi* Curran.**

Journ. F.M.S. Mus., XIV, 179, 1928.

♂, Kedah, Catchment Area, near Jitra, April 11, 1928, (H. M. Pendlebury).

***Milesia callida* Curran.**

Journ. F.M.S. Mus., XIV, 181, 1928.

7 ♂, 5 ♀, Kedah Peak, 3,300 to 3,950 ft., March 11 to 28, 1928; ♂ ♀, Kedah, Catchment Area, near Jitra, April 10, 1928, (H. M. Pendlebury); ♂, Long Akar, Baram River, Sarawak, Oct. 29, 1920, (J. C. Moulton).

***Milesia tenuiformis* Curran.**

Journ. F.M.S. Mus., XIV, 176, 1928.

♂, S. China Sea, Anamba Island, Pulau Siantan, (F. N. Chasen); ♂, Pulau Aor, May 1927, (N. Smedley); ♀, Kedah, Catchment Area, near Jitra, April 6, 1928, (H. M. Pendlebury).

## EUMERINAE

Genus *Eumerus* Meigen.

Syst. Besch. Eur. Dipt., iii, 202, 1822.

*Citibæna* Walker, Proc. Linn. Soc. London, i, 124, 1857.

The species which I described as *E. trepidus* is identical with *Azpeytia scutellaris* Walker, a genus belonging to the *Eristalinæ* and being most nearly related to *Merodon*.

## Table of Species.

- |  |                                  |
|--|----------------------------------|
| 1. Scutellum unicolorous blackish or metallic - - -  | 2.                               |
| Scutellum wholly or partly red or yellow - - -   | 6.                               |
| 2. Second abdominal segment with a pair of clear yellowish or orange spots; hind tarsi partly white or pale yellow - - - | 3.                               |
| Second abdominal segment with grayish pollinose spots; hind tarsi wholly brownish - - -                                  | <i>insistens</i> Curran.         |
| 3. Posterior tibiæ of both sexes wholly pale pilose - - -  | 5.                               |
| Posterior tibiæ partly black pilose, at least on the apical half of posterior surface - - -                              | 4.                               |
| 4. All the posterior tarsal segments of the male white -   | <i>argentipes</i> Walker.        |
| Basal segment of the posterior tarsi blackish - - -  | <i>aurifrons</i> Wiedemann.      |
| 5. Apical four tarsal segments of posterior four legs whitish in male; abdominal pollen bright yellow - - -              | <i>splendens</i> Wiedemann.      |
| Tarsi yellow; abdominal pollen pale yellowish-grey - - -   | <i>deceptor</i> Curran.          |
| 6. Pile of scutellum tawny - - -   | <i>rufoscutellatus</i> Brunetti. |
| Pile of scutellum pale brassy yellow or cinerrom - - -   | <i>marginatus</i> Grimshaw.      |

*Eumerus argentipes* Walker.

Proc. Linn. Soc. London, V, 284, 1861.

A single male, Pulau Dayang, May, 1927, (N. Smedley.)

**Eumerus aurifrons** Wiedemann.*Pipiza aurifrons* Wiedemann, Anal. Ent. 32, 1824.

One female, Pulau Dayang, May, 1927, (N. Smedley.)

**Eumerus rufoscutellatus** Brunetti.

Rec. Indian Mus., ix, 269, (1913).

A single ♂, Siam, Chiengmai, Chun Kiau, Oct. 27, 1920, (Hele et Hele jr.).

The original description was based on a poorly preserved specimen. The face is whitish pollinose and pilose, the grey spots on the mesonotal suture do not reach nearly to the vittæ; the scutellum appears bronzed and has a yellow border. The pile on the dorsum of the abdomen is yellowish and not microscopic, though short. The genitalia are very large and there is a complicated arrangement on the venter.

**Eumerus marginatus** Grimshaw.

Fauna Hawaiiensis, iii, 82, 1902.

One female, Selangor, Kuala Lumpur, January 29, 1930, (H. M. Pendlebury).

## SYRPHINAE

Genus **Syrphus** Fabricius.

The addition of several species of *Syrphus* from Borneo and Malaya enables me to present a much more comprehensive key than that contained in my previous paper.

## Table of Species.

- |  |     |                                  |
|--|-----|----------------------------------|
| 1. Eyes pilose - - - -                                 | 2.  |                                  |
| Eyes bare - - - -                                      | 11. |                                  |
| 2. Face with median black or brown vitta - - -         | 3.  |                                  |
| Face wholly pale - - -                                 | 7.  |                                  |
| 3. Abdominal bands all interrupted - - - -             | 4.  |                                  |
| At least one band entire -                             | 5.  |                                  |
| 4. Anterior femora almost wholly black - - - -         |     | <i>königsbergeri</i> de Meijere. |
| Apical half of anterior femora reddish - - - -         |     | <i>latistrigatus</i> de Meijere. |
| 5. Pleura whitish pilose - - -                         | 6.  |                                  |
| Pleura yellow or tawny pilose - - - -                  | 10. |                                  |
| 6. Facial vitta almost reaching the antennæ - - -      |     | <i>serarioides</i> de Meijere.   |
| Facial vitta extending but little above the tubercle - |     | <i>serarius</i> Wiedemann.       |

7. Pale abdominal fasciæ very narrow, the first one not widened laterally - - 10.  
 Pale fasciæ wide, the first one widest laterally - 8.
8. Lower squamal lobe bare above - - - 9.  
 Lower squamal lobe with long hairs above - - *torvus* Osten Sacken.
9. Mesonotum rather dull black - *chrysotoxoides* Curran.  
 Mesonotum æneous - - *torvoides* de Meijere.
10. Frontal prominence red anteriorly; abdominal fasciæ grayish - - - *griseocinctus* Brunetti.  
 Frontal prominence wholly black in front; abdominal fasciæ reddish - - *hirsuteron* sp. n.
11. Sides of mesonotum sharply defined bright yellow on whole length - - 12.  
 Sides of mesonotum not bright yellow in ground color, at least above the wings, sometimes more or less reddish or dusted with yellow - - - 23.
12. Face with a median black vitta - - - 13.  
 Face without median black vitta - - - 18.
13. Posterior femora wholly black - - - 15.  
 Posterior femora yellowish on almost the basal half - 14.
14. Posterior tibiæ wholly black - *robinsoni* Curran.  
 Posterior tibiæ with a broad, median yellowish band - *Sphærophoria* sp.
15. Scutellum with a large black triangle resting on the base - - - 16.  
 Scutellum without dull black markings - - - *kinabalensis* sp. n.
16. Yellow fascia on second abdominal segment entire - *circumdatus* de Meijere.  
 Yellow fascia composed of two subtriangular spots - 17.

17. Genital claspers bordered with a fringe of long, stiff, yellowish hairs - *hervebazini* Curran.  
 Genital claspers with normal, short, sparse hairs - *pendleburyi* Curran.
18. Posterior femora yellow on the basal third, at least on upper half - 21.  
 Posterior femora wholly black - 19.
19. Mesonotum opaque, rather bluish-gray on the median third - 20.  
 Mesonotum shining black - *difficilis* Curran.
20. Frontal triangle somewhat swollen; anterior femora black basally - *variscutatus* Curran.  
 Frontal triangle not at all bloated; anterior four femora wholly reddish-yellow - *fascipleura* sp. n.
21. Mesopleura wholly yellowish - 22.  
 Mesopleura broadly black in front - *citrinum* Brunetti.
22. Pale spots on second abdominal segment small and lunulate - *luteifrons* de Meijere.  
 Spots on second segment subtriangular - *clarus* Hervé-Bazin.
23. Lower lobe of squamæ bare above - 24.  
 Lower lobe of squamæ with long hairs above - *fulvifacies* Brunetti.
24. Second, third and fourth abdominal segments with two yellowish and two black bands, the anterior yellow band often interrupted - 25.  
 Third and fourth segment with only one pale fascia, exclusive of the posterior margin - 30.
25. All the pale fasciæ, except that on the base of the third segment, interrupted - *arcifer* Sack.  
 At least the second and third abdominal segments with with entire pale fasciæ - 26.

26. The anterior black fascia on the second and third segments is formed by a pair of very narrow, strongly oblique stripes - - - *divertens* Walker.  
The black fascia is scarcely oblique - - - 27.
27. Frontal triangle practically wholly yellow pilose; front of female mostly yellowish to cinereous pilose - - - 28.  
Frontal triangle and front of ♀, black pilose - - 29.
28. Scutellum almost wholly pale pilose - - - *viridaureus* Wiedemann.  
Scutellum of ♂ black pilose, of ♀ pale pilose on basal half - - - *obligatus* sp. n.
29. Sternites with black posterior fasciæ; third antennal segment one and three-quarters as long as wide - *nectarinus* Wiedemann.  
Sternites without black fasciæ; third antennal segment only one-fourth longer than wide - - *balteatus* De Geer.
30. Abdomen elongate, slender with almost parallel sides - - - 31.  
Abdomen elongate oval - 35.
31. Face with a median black vitta - - - 32.  
Face wholly yellowish - - 33.
32. The yellow spots on the sides of the second segment join the yellow of the preceding segment in their full width - - *deceptor* Curran.  
The yellow spots on the second segment join the yellow of the first segment only narrowly at the sides or the yellow fascia entire - 37.
33. All the very broad pale abdominal fasciæ are interrupted - - - *malayensis* Curran.

- Pale fasciæ on segments two  
and three entire - - 34.
34. The pale fasciæ on second and  
third segments very  
strongly arched and  
angular in front and be-  
hind, the anterior edges  
strongly oblique - - *morna* sp. n.
- The pale fasciæ are only  
gently arched and only  
slightly oblique to the  
base of the segment - *stigifrons* de Meijere.
35. Second abdominal segment  
with the base pale on its  
whole width - - - *erul* Curran.
- Second segment black basally  
except at the sides - 36.
36. Sides of mesonotum sharply  
defined yellow except be-  
hind the base of the  
wings - - - *kinabalensis* sp. n.
- Sides of mesonotum not pure  
yellow in ground color - *confrator* Wiedemann.
37. Second segment with the yel-  
low fascia interrupted - *tenuiformis* Curran.
- Second segment with an  
entire yellow fascia - *peteus* sp. n.

***Syrphus divertens* Walker.**

Proc. Linn. Soc. London, i, 124, 1857.

*Syrphus claviger* Sack, Stett. Ent. Ztg., lxxxviii, 308, 1927. (f.)

♀, Selangor, Bukit Kutu, 3,500 ft., Sept. 14, 1929, (H. M. Pendlebury).

Originally described from Borneo. It has been redescribed by Sack from Formosa. The mesonotum bears a pair of very strong yellowish vittæ which do not, however, reach to the scutellum.

***Syrphus arcifer* Sack.**

Stett. Ent. Ztg., lxxxviii, 306, 1927. (f.)

♀, Kedah Peak, 3,000 ft., March 13, 1928, (H. M. Pendlebury).

In this species the front is polished behind the ocelli, whereas in *divertens* it is yellowish pollinose. The original description was based on specimens from Formosa.



**Syrphus viridaureus** Wiedemann.

Anal. Ent., 35, 1824; Ausser. Zweifl., ii, 137, 1830.

*Syrphus alternans* Macquart, Dipt. Exot., ii, (2), 89, 1842.

♂, Pulau Dayang, May, 1927 (N. Smedley); ♂, Perak, Gunong Kledang, 2,650 ft., Nov. 24—26, 1927 (E. Seimund).

**Syrphus obligatus** sp. n.

Related to *viridaureus* Wiedemann, but much darker in color, in this respect approaching *nectarinus* Wiedemann. Frontal triangle pale yellow pilose; scutellum black pilose. Female front yellow pilose; scutellum black pilose on apical half. Length, 8 to 10.5 mm.

*Male.* Face, cheeks and sides of the front reddish-yellow in ground color, reddish-yellow pollinose, the tubercle bare; face gently receding, with a moderately large, convex tubercle a little below the middle; jowls usually partly brown in ground color. Occiput blackish, the ground color concealed by whitish-yellow pollen. Frontal triangle black or brown, shining on the anterior two-fifths, reddish-yellow pollinose above. Vertical triangle thinly brown pollinose, blackish pilose. Occipital pile whitish-yellow, becoming reddish above. Pile of face and front yellowish. Antennæ reddish; third segment oval, only a little longer than wide; arista luteous.

Thorax brownish-black, yellow pilose. Mesonotum with a pair of broadly separated, reddish-yellow pollinose vittæ on the anterior two-thirds and with a more or less distinct, much more slender median vitta between them. Humeri luteous; notopleura, a large spot on the mesopleura and the posterior calli, reddish-yellow. Pleura thinly reddish-yellow pollinose, a broad stripe extending over the mesopleura and sternopleura, the humeri and protopleura, thickly reddish-yellow pollinose. Scutellum reddish-yellow; black pilose.

Legs reddish-yellow; coxæ brown except their apices. Subapical half of the posterior femora, their tibiæ wholly and the apical four segments of the posterior tarsi, brown, and clothed with black hair, the hair elsewhere on the legs rather bright yellow.

Wings very strongly tinged with brown. Squamæ whitish, with yellow fringe. Halteres yellow.

First abdominal segment shining greenish-black, the sides and linear anterior border reddish-yellow. Second segment with two reddish-yellow and two dull black fasciæ, the basal fascia yellow and broadly interrupted in the middle by a shining black spot; following fascia black, not as wide as the pale fascia, very broadly separated from the lateral margins, and slightly widened medially. The second pale fascia is moderately to only narrowly interrupted in

the middle and is about as wide as the posterior black fascia. The yellow of the third segment occupies the basal two-thirds of the segment and is incompletely crossed by a narrow black fascia, which is close to the base of the segment in the middle and rather broadly separated from it at the sides. Fourth segment similar, but with the apex more or less reddish. Fifth segment with a very large reddish triangle on either side basally and with the apex reddish. Pile black, the basal one and one-half segments and the basal half of the third, yellowish pilose. Venter reddish-yellow, the second to fourth sternites with the posterior border very broadly black, and black pilose.

*Female*. Anterior border of front reddish-yellow, with a roundish black spot above each antenna; a median triangle, narrowly produced above to reach ocelli, and a band across the ocellar region, shining bluish-black, the front otherwise brownish yellow pollinose and yellowish pilose. Median pollinose vitta on mesonotum very distinct. Posterior femora with the broad apices tinged with brown. Anterior dark bands on the abdominal segments narrower, those on the third and fourth segments much more widely separated from the base of the segment and but little arched. Fifth segment with three black triangles, one in the middle and one on either posterior angle. Wings cinereous hyaline.

Described from 46 ♂, 3 ♀, Kedah Peak, 3,000 to 3,950 ft., March 9 to 23, 1928, the holotype, male and allotype, ♀, March 11; and ♂ ♀, Selangor, Bukit Kutu, 3,500 ft., Sept. 13, 1929, (H. M. Pendlebury).

In this species the mesonotum appears bluish-black to the naked eye, and not greenish, as is the case in *viridaureus*.

***Syrphus morna* sp. n.**

Related to *cinctellus* Zetterstedt, but there is a black lateral triangle basally on the third and fourth abdominal segments and the black posterior fascia is much more strongly produced forward in the middle. Length, 9.5 to 11 mm.

*Female*. Face and cheeks reddish-yellow or yellowish, the face with yellow pollen except on the rather large tubercle, concave above, the oral margin almost as prominent as the antennal base. Front thickly ochreous pollinose almost to the level of the ocelli, in the middle broadly bare and shining blue-black, the frontal prominence and vertex similarly colored, the former without pale anterior border. Occiput yellowish pollinose. Pile of the head yellowish, on the upper fourth of the front and vertex, black. Antennæ reddish-yellow; third segment three-fourths longer than wide.

Mesonotum olivaceous black, in front of the suture yellow pollinose with a pair of median vittæ and an oval spot on either side bare or nearly so; lateral margins broadly yellow anteriorly. Pleura yellow and yellow pollinose on the anterior half, the metapleura brownish-yellow; mesopleura only obscurely yellowish above. Pile yellowish; on the posterior half of the mesonotum brown or black. Scutellum translucent reddish-yellow, black pilose.

Legs reddish-yellow; a broad band on the apical third of the posterior femora and the posterior tibiæ and tarsi, brownish. Hair yellow, black on the posterior legs except the basal half of the femora.

Wings cinereous hyaline or tinged with brown, narrowly darker in front and apically. Squamæ and halteres yellow.

First abdominal segment yellowish, with a small rectangular median spot of black. Second yellow with a large, black apical triangle which does not quite reach the lateral margins and is broadly produced to the base of the segment in the middle. Third segment with a large black triangle posteriorly which reaches the sides broadly and extends forward in the middle to the basal third of the segment and with the basal angles bearing triangles; the resultant yellow band is very strongly and angularly arched posteriorly and its width is equal to about one-third the length of the segment. Fourth segment similar but the pale fascia reaches the base of the segment more broadly and is narrowed laterally. Fifth segment with a reddish-yellow posterior border and a large, subtriangular spot on either side, the spots broadly separated from the lateral margin. Pile black, short; yellow on the base of the abdomen and sides of the second and third segments. Venter yellow, black haired on the apical half.

Type, ♀, Pahang, F.M.S., Fraser's Hill, 4,200 ft., Jan. 2, 1930.

Paratype, ♀, N. Borneo, Mt. Kinabalu, Marei Parei, 5,000 ft., April 30, 1929, (H. M. Pendlebury).

***Syrphus strigifrons* de Meijere.**

♀, Lubok Tamang, Lipis District, Pahang, 3,500 ft., June, 1923, (F. N. Chasen) ♀, Selangor, Bukit Kutu, 3,500 ft., Sept. 9, 1929; ♂, West Coast, Langkawi Island, April 25, 1928, (H. M. Pendlebury).

***Syrphus variscutatus* Curran.**

Journ. F.M.S. Mus., xiv, 210, 1928.

♂, Lubok Tamang, Lipis District, Pahang, 3,500 ft., June 1923, (F. N. Chasen).

**Syrphus robinsoni** Curran.

Journ. F.M.S. Mus., xiv, 208, 1928.

♀, Perak, Gunong Kledang, 2,658 ft., Nov. 17, 1927, (E. Seimund).

**Syrphus citrinum** Brunetti.*Xanthogramma citrinum* Brunetti, Fauna Brit. India, Dipt., iii, 95, 1923.

Seven ♂, Siam, Chiangmai, Oct. 20, 26, 1920, (Hele).

In these specimens the yellow spots are much more triangular than shown in Brunetti's figure, so it is possible that the identification is not correct.

Genus **Asarkina** Macquart.

The present collection contains four species, all of which were represented in the collection previously reported upon.

## Table of Species.

- |  |    |                           |
|--|----|---------------------------|
| 1. Wings largely black or brown,<br>with the balance hyaline -   | 2. |                           |
| Wings more or less evenly in-<br>fuscated or hyaline -   | 3. |                           |
| 2. Wings with a pale (usually<br>hyaline) subbasal fascia;<br>pile on mesopleura and<br>squamal fringe distinctly<br>yellowish - - -   |    | <i>agrotæ</i> Fabricius.  |
| Wings without a pale subba-<br>sal fascia; pile on meso-<br>pleura pure silvery-white;<br>squamæ with white<br>fringe - - -  |    | <i>pura</i> Curran.       |
| 3. Face without a median black<br>stripe - - -   | 4. |                           |
| Face with a median black<br>stripe, or the tubercle<br>black - - -   | 6. |                           |
| 4. Frontal triangle and lower part<br>of front of ♀ yellow<br>pilose - - -   | 5. |                           |
| Frontal triangle and front<br>black pilose - - -   | 9. |                           |
| 5. Third antennal joint oval,<br>laterally compressed; black<br>abdominal fasciæ more<br>than one-third as wide as<br>length of third segment;<br>apical half of posterior<br>femora, and their tibiæ<br>wholly, brown - - |    | <i>laticornis</i> Curran. |

Third antennal joint not compressed, tapering; black abdominal fasciæ not one-fourth as wide as length of third abdominal segment; posterior femora wholly reddish, their tibiæ scarcely darker (*selangensis* Curran) - - -

*salviæ* Fabricius.

6. Cheeks wholly orange coloured before the jowls, the median facial vitta not reaching the oral margin - -

*incompleta* Curran.

Cheeks wholly or more than half black before the jowls, the median facial vitta reaching the oral margin -

7.

7. All the femora broadly blackish apically; pile on disc of mesonotum black - -

*nigripes* Curran.

All femora orange basally; pile of mesonotum wholly tawny - - -

8.

8. Face wholly black in ground color - - -

*marokaensis* de Meijere.

Face broadly pale in ground color laterally - -

*biroi* Bezzi.

9. First abdominal segment wholly orange except the incisure - - -

*consequens* Walker.

First abdominal segment black beneath the scutellum, the sides orange - - -

*consequens* var. *exilis* Curran.

### **Asarkina ægrota** Fabricius.

*Eristalis ægrota* Fabricius. Syst. Antl., 243, 1805.

Two males, Kedah Peak, 3,950 ft., March 21, 1928; ♀, Kedah, Catchment area near Jitra, April 5, 1928; 2 ♀, West Coast, Langkawi Island, April 21, 28, 1928, (H. M. Pendlebury), and ♀, S. China Sea, Anamba Island, Pulau Siantan, (F. N. Chasen).

### **Asarkina salviæ** Fabricius.

*Syrphus salviæ* Fabricius, Mant. Ins., ii, 340, 1787.

Two males, Kedah, Catchment area near Jitra, April 9, 1928, (H. M. Pendlebury).

**Asarkina consequens** Walker.

*Syrphus consequens* Walker, Proc. Linn. Soc. London, i, 18, 1856.

*Syrphus striata* Wulp, Sumatra Exp., Dipt., 32, 1881.

*Asarcina kelantanensis* Bezzi, Ann. Mus. Nat. Hung., vi, 498, 1908.

Nine males: Kedah Peak, 1,000 to 3,000 ft., March 14—30, 1928; 2, ♂, 2 ♀, Kedah, near Jitra, April 10, 1928; ♂, West Coast, Langkawi Island, April 21, 1928; 3 ♂, Selangor, Bukit Kutu, 3,500 ft., Sept. 6, 7, 1928, (H. M. Pendlebury).

**Asarkina laticornis** Curran.

Journ. F.M.S. Mus., xiv, 235, 1928.

33 ♂, Kedah Peak, 3,300 to 3,950 ft., March 9 to 22, 1928; 2 ♂, Selangor, Bukit Kutu, 3,500 ft., Sept. 13, 1929, (H. M. Pendlebury).

**Asarkina incompleta** Curran.

Journ. F.M.S. Mus., xiv, 239, 1928.

An unfortunate error occurs in the original description of this species which must result in confusion. The caption has been placed in the middle of the description on page 240 instead of immediately preceding the third last paragraph on page 239.

Genus **Sphærophoria** St. Fargeau et Serville.

**Sphærophoria javana** Wiedemann.

*Syrphus javanus* Wiedemann, Anal. Ent. 34, 1824.

♂, Kedah, Catchment area near Jitra, April 7, 1928; ♀, Kedah Peak, 3,500—3,950 ft., March 14, 1928, (H. M. Pendlebury).

Genus **Ischiodon** Sack.

**Ischiodon scutellaris** Fabricius.

*Scarra scutellaris* Fabricius, Syst. Antl., 252, 1805.

♀, Kedah Peak, 3,000 ft., March 18, 1928, (H. M. Pendlebury).

Genus **Baccha** Fabricius.

A goodly number of specimens belonging to this difficult genus are in the collections, three of which are described as new to science. One of these is from Borneo and is treated in the paper dealing with the *Syrphidæ* from that region.

**Table of Species.**

- |                               |     |
|-------------------------------|-----|
| 1. Scutellum wholly or partly |     |
| yellow - - - -                | 2.  |
| Scutellum wholly blackish -   | 12. |

2. Face with a median black stripe - - - - 3.  
Face wholly yellowish or reddish - - - - 7.
3. Wings with a broad, brownish median band - - *dispar* Walker.  
Wings brown only along the costal border - - 4.
4. Abdomen reddish with three broad, transverse black fasciæ - - - - *amphithoe* Walker.  
Abdomen much more extensively black - - - 5.
5. Alula almost linear, very narrow; ventral scutellar fringe absent; squamal fringe inconspicuous - 6.  
Alula of moderate width; ventral scutellar fringe yellow; squamal fringe yellow, well developed - *pedicellata* Doleschall.
6. Costal border of wings almost evenly brown from base to apex (Selangor) - *nigrapex* sp. n.  
Costal border pale basally, the brown forming an apical spot - - - - *triangulifera* Austen.
7. Wings dark only in front - 8.  
Wings wholly brown, darker in front - - - - *virtuosa* Curran.
8. Fourth abdominal segment not wholly black - - 9.  
Fourth abdominal segment wholly black - - - *macgregori* Curran.
9. Legs entirely reddish - - *rubella* Wulp.  
Legs partly black - - 10.
10. Costal border brown on the whole length; scutellum wholly pale - - - *gigas* sp. n.  
Costal border not brown on the whole length; scutellum with black spot - 11.
11. Third abdominal segment with very broad, entire yellowish fascia - - *tinctiventris* de Meijere.

- Third abdominal segment  
with a pair of elongate,  
longitudinally placed yellowish spots - - - *luteolimbata* de Meijere.
12. Sides of the face broadly yellowish in ground color on more than the upper half - - - 13.
- Sides of face black in ground color on more than the upper half - - - 15.
13. Wing with the alula of full size - - - *pulchrifrons* Austen.
- Alula distinctly narrowed - 14.
14. The yellow of the sides of the thorax is wholly limited to the notopleura - - *porphyra* Curran.
- The yellow color extends onto the surrounding parts in front of the suture - - *fallax* Austen?
15. Wings with narrow, conspicuous clouds on the crossveins - - - *maculata* Walker.
- Crossveins at middle of wing not conspicuously clouded - - - 16.
16. Humeri haired posteriorly - 17.
- Humeri not haired posteriorly - - - *varipes* Curran.
17. Wings with small apical brown spot - - - *nigricoxa* Curran.
- Wings hyaline, the stigma brown - - - *chalybescens* sp. n.

### Sub-genus *Baccha*

Humeri wholly without hair.

*Baccha dispar* Walker.

Proc. Linn. Soc. Lond, iv, 121, 1860.

♀, Selangor, Bukit Kutu, 3,500 ft., Sept. 13, 1929 (H. M. Pendlebury).

*Baccha pedicellata* Doleschall.

Nat. Tijd. v. Ned. Ind., x, 411, 1856.

♀, S. China Sea, Anamba Island, (F. N. Chasen).



**Baccha maculata** Walker.

Ins. Saunders. Dipt., 223, 1852.

*Baccha austeni* de Meijere Tijds. v. Ent., li, 325, 1908.

*Baccha eronis* Curran, Journ. F.M.S. Mus., xiv, 248, 1928.

5 ♂, Kedah Peak, 3,500 ft., March 18 to 29, 1928, (H. M. Pendlebury).

I have little doubt about the above synonymy being correct. However, it seems likely that the species reported from Formosa is distinct. I have two females from that locality and they have the apical abdominal segments broadly reddish on their whole length in the middle. In his description of *austeni* de Meijere did not mention such a difference between the two sexes. Since *maculata* was described from "East Indies" it is safe to presume that the name applies to East Indian specimens rather than to those occurring as far away as Formosa.

**Baccha nigrapex** sp. n.

Base and sides of scutellum yellow, the apex black, costal border of wings narrowly brown to slightly beyond the tip of the third vein; humeri bare. Length, 13 mm.

*Male*. Face, frontal triangle and anterior two-thirds of the cheeks pale orange, the pile very fine and yellowish; a broad median facial stripe which is narrowed below the tubercle and a frontal stripe which narrows above but reaches the upper angle of the frontal triangle, shining black, the upper half of the frontal triangle yellowish pollinose. Occiput and cheeks greenish-black, cinereous white pollinose and whitish pilose. Upper fifth of the occiput thinly brownish pollinose and with short yellow or reddish hair. Vertical triangle long and narrow, the small ocellar triangle situated near the anterior fourth; pollen thin, cinereous; hair in two rows, brownish-yellow, short and fine. Antennæ pale orange, the arista brown except basally. Oral margin as prominent as the antennal base, the tubercle of moderate size and prominent.

Thorax brownish-black; humeri and a very broad stripe reaching to the suture, the mesopleura mostly and a very large spot below, a large spot on the metapleura and a smaller, subtriangular spot below, reddish-yellow, all the spots sharply defined and not pollinose. Mesonotum with extremely short, appressed reddish-yellow hair, the pleura with slightly longer, yellowish pile. Posterior calli reddish-brown. Scutellum with the broad base and still broader sides, reddish-yellow, the apical part shining blackish; hair erect, extremely short, yellowish; no ventral fringe.

Legs orange; coxæ brown; posterior femora brown except the base and apex; posterior tibiæ black on almost

the apical two thirds; basal segment of posterior tarsi black, with orange tip. Hair very short, pale yellowish, black on the dark portions of the posterior legs; long only on the posterior surface of the middle femora.

Wings cinereous hyaline, the costal border narrowly brown on its whole length, the anterior crossvein faintly clouded with brown. Alula very narrow. Squamæ yellow, with inconspicuous fringe. Halteres reddish-yellow.

Abdomen very elongate, slender, broadened apically. First segment reddish-yellow; second brown the base narrowly yellowish at the sides. Third segment brown, with a broad preapical fascia which is convex in front, transverse posteriorly and reaches the sides moderately widely; behind this blackish brown. Fourth segment brownish-black, fifth brown; genitalia brownish-red. Pile black, short; longer and pale yellowish on the first segment, sides of the second and on the genitalia; the hair on the sides of the second segment not as long as usual. Venter brownish-red, the fifth sternite shining black and black haired.

Described from a single ♂, Selangor, Bukit Kutu, 3,500 ft., Sept. 13, 1929, (H. M. Pendlebury).

***Baccha varipes* Curran.**

Journ. F.M.S. Mus., xiv, 252, 1928.

2 ♂, Pahang, Gunong Tahan, Seat Point, 5,460 ft., Dec. 20, 1922; ♂, Pahang, Wray's Camp, 3,300 ft., Dec. 11, 1921, (H. M. Pendlebury).

The type was taken in the same place on Dec. 21, 1922.

**Sub-genus *Allobaccha***

Humeri with hair posteriorly.

***Baccha pulchrifrons* Austen.**

Proc. Zool. Soc. Lond., p. 139, 1893.

♂ ♀, Selangor, Kuala Lumpur, Oct. 27, 1924 and June 21, 1928, (H. M. Pendlebury).

I am still uncertain about the exact identity of *pulchrifrons* and therefore about the identity of these two specimens. However, the size of the alula seems to be correct since, in both these specimens it is much wider apically than in the two allied species, and narrows strongly toward the base.

In his original description Major Austen called attention to the similarity of his species and *apicalis* Loew. In view of the fact that *pulchrifrons* occurs commonly in Japan, whence Loew's damaged specimen came, it seems probable that Loew's name should be applied to this species.

**Baccha fallax** Austen.

Proc. Zool. Soc. Lond., p. 142, 1893.

7 ♂, Selangor, Bukit Kutu, 3,500 ft., April 16, 1926, and Sept. 6, 13, 14, 1929; ♂, Kedah Peak, 3,900 ft., March 28, 1928, (H. M. Pendlebury).

The same uncertainty applies here, as in the case of *pulchrifrons*. The apical wing spot is much narrower than in that species and the same is true of the alula. However, none of the males have the abdominal markings as described by Austen, although in a single specimen from Borneo, (recorded elsewhere) the markings agree quite well. It seems possible that Major Austen described two unusually pale specimens and that the differences between the males of the two species are actually very slight. Some of my specimens even show traces of the violaceous spots on the sides of the antennal prominence.

**Baccha porphyra** Curran.

Journ. F.M.S. Mus., xiv, 254, 1928.

♂, Kedah, Catchment area, near Jitra, April 9, 1928, (H. M. Pendlebury).

**Baccha chalybescens** sp. n.

Bluish-black; wings hyaline; legs mostly reddish. Length, 8.5 mm.

*Female*. Head black; occiput, sides of face very broadly and a pair of moderately separated rectangular spots near the middle of the front; greyish-white pollinose. Pile of occiput face and across the middle of the front white, elsewhere blackish. Occiput thinly brown pollinose and black haired on upper sixth. Front of moderate width, widening anteriorly; ocelli placed well forward, the triangle somewhat longer than wide. Face narrowest below, with prominent tubercle situated mostly below the middle, retreating from the tip of the tubercle to the oral margin. Antennæ reddish-brown, the third segment reddish below; arista brown, with reddish base.

Thorax shining bluish-black, clothed with short, whitish pile. Humeri black. A broad stripe extending from the humeri to the suture and most of the pleura, whitish pollinose, a band below the wings practically bare. Scutellum blue-black, white pilose and with yellowish ventral fringe.

Legs reddish; coxæ and trochanters black; posterior femora black, with the base and apex broadly reddish; posterior tibiæ brown on apical half, the apical four segments of their tarsi reddish-brown.

Wings hyaline; stigma blackish-brown; alula narrow. Squamæ white, with white fringe. Halteres reddish-yellow.

Abdomen metallic blue and black. First segment metallic blue, second metallic blue with broad black bands; third black with a broad, strongly arched, medianly interrupted metallic blue fascia which is separated from the base of the segment by more than its own width and extends almost the whole length of the segment laterally. Fourth segment black, the lateral margins and a large subbasal triangle metallic blue. Fifth and sixth segments metallic blue, the disc of the former darker. Pile cinereous-white; black on the black parts of the third and fourth segments and the whole of the following two. Venter metallic blue, with black markings on the middle of the third and fourth sternites. Hair black except basally. Abdomen very strongly pedicellate, the second segment subcylindrical, slightly widened basally and apically, the third very strongly widening from base to apex.

Described from one ♀, Selangor, Bukit Kutu, 3,500 ft., Sept. 8, 1929, (H. M. Pendlebury).

**Paragus serratus** Fabricius.

*Mulio serratus* Fabricius, Syst. Antl., 186, 1805.

♂ ♀ West Coast, Langkawi Island, April 19, 21, 1928, (H. M. Pendlebury); ♀, East Coast Pulau Dayang, May, 1927, (N. Smedley).

Genus **Melanostoma** Schiner.

**Melanostoma univitattum** Wiedemann.

*Syrphus univitattus* Wiedemann, Anal. Ent., 36, 1824.

♂, Selangor, Ulu Gombak, Jan. 5, 1930; 3 ♂, Kedah Peak, 3,000 to 3,950 ft., March 8, 11, 14, 1928; ♀, Kedah, Catchment Area, near Jitra, April 7, 1928, (H. M. Pendlebury); ♂, Selangor-Pahang, Semangko Pass, 2,700 ft., March 1912.

**Melanostoma talamaui** de Meijere.

Tijd. v. Ent., lvii, Suppl. 15, 1924.

*M. gedehensis* Curran (not de Meijere), Journ. F.M.S. Mus., xiv, 259, 1928.

The description of this species had not come to hand when the manuscript of my previous paper was sent to the editor. A careful comparison of de Meijere's descriptions of *Melanostoma* convinces me that his *gedehensis* is a very different species from *talamaui*, which is closely related to *orientalis* Wiedemann. The name *gedehensis* will have to be used in place of *quadrimaculata* de Meijere since Bigot (1884) described a species from Mexico under that name. The typical form is therefore left without a name, but unless it proves to be distinct from the form described as variety *gedehensis* a name is quite unnecessary.

## CHEILOSINAE

**Spheginobaccha macropoda** Bigot.

*Sphegina macropoda* Bigot, Ann. Soc. Ent. Fr., (6) iii, 331, 1883.

♂, 3 ♀, Kedah, Catchment Area, near Jitra, April 7, 9, 11, 1928; ♀, West Coast, Langkawi Island, April 25, 1928, (H. M. Pendlebury); 2 ♂ 2 ♀, S. China Sea, Anamba Island, Pulau Siantan, (F. N. Chasen).

## XYLOTINAE.

Genus *Syritta* St. Fargeau et Serville.

**Syritta orientalis** Macquart.

Dipt. Exot., ii, (2), 76, 1842.

♀, West Coast, Pulau Angsa, light house, at light, Oct., 27, 1926, (E. Seimund).

## ERISTALINAE.

Genus *Mallota* Meigen.

**Mallota sufficiens** Curran.

Journ. F.M.S. Mus., xiv, 291, 1928.

♀, Kedah Peak, 3,000–3,500 ft., March 15, 1928; ♀, Selangor, Bukit Kutu, 3,500 ft., Sept. 11, 1929 (H. M. Pendlebury).

**Mallota malayana** nom. n.

*Mallota eristaloides* Curran, Journ. F.M.S. Mus., xiv, 293, 1928, (nec. Loew).

This name is proposed on account of preoccupation by Loew, (N. Beitr. iv, 17b, 43, 1856).

Genus *Azpeytia* Walker.

Four species have been placed in this genus and a fifth is before me from Selangor. I have not seen *bifascia* Brunetti but from the description and figures believe it should be place in a different genus. The following key separates the known species.

1. Oral margin distinctly produced, the face almost straight, retreating - - 2.
- Oral margin not produced; face convex - - - *bifascia* Brunetti.
2. Wings brownish with the posterior border broadly pale - - - *scutellaris* Walker.
- Wings yellowish or hyaline with brown markings or strongly clouded along the veins on the apical half - - - 3.

3. Sides of the abdomen yellowish  
pilose - - - - 4.  
Sides of the abdomen black  
pilose on apical half or  
more - - - - *flavoscutellata*  
Kertesz.
4. Genitalia of ♀ black haired;  
mesonotum wholly tawny  
or yellow pilose - - *albomaculata* sp. n.  
Genitalia of ♂ yellow haired;  
mesonotum brown pilose  
on the disc - - - *maculata* Shiraki.

***Azpeytia albomaculata* sp. n**

Related to *maculata* Shiraki but with differently colored pile, scutellum, etc. It resembles *maculata* in having only two pollinose abdominal lunules. Length, 13 mm

*Male*. Head black; a bare brownish-yellow triangle on either side of the face above. Face almost evenly receding, the oral margin conspicuously produced; moderately brown pollinose. Frontal triangle large, shining black, with a rather strong tubercle in the middle anteriorly; vertical triangle elongate, brownish pollinose. Occiput yellowish-gray pollinose and clothed with yellowish to tawny pile, the face and front and vertical region with coarse, moderately long black pile, the eyes with fine yellowish pile. Antennæ black, the third segment elongate, rather pointed below at apex; arista black, broadly reddish-yellow basally.

Thorax submetallic black, clothed with reddish-yellow to tawny pile, the pleura with pale brown pollen; pile on notopleura and posterior calli more abundant and erect. Scutellum brown or black basally, becoming brownish-red apically, the pile wholly short and pale.

Femora black, with reddish apices; tibiæ brown with the basal half yellow; tarsi brownish-red, the apical two segments brown, the basal segments of the posterior pair reddish-brown dorsally. Pile yellowish, black and longer on the under surface of the posterior femora except basally. Posterior femora slightly enlarged, with seven short spines on the antero-ventral surface apically and five on the postero-ventral surface. Posterior tibiæ slightly curved.

Wings yellowish or luteous on basal anterior half; pale greyish posteriorly, although the veins may be bordered with brownish-yellow; apical third with a brown cloud which becomes paler apically and posteriorly and may sometimes be brownish-yellow and poorly defined. Squamæ brownish-yellow, with yellow fringe. Halteres yellow.

Abdomen shining black, bearing two depressed, thinly gray pollinose lunules, situated on the posterior half of the second and third segments, the pair on the second

segment oblique, their inner ends at the middle of the segment. Pile on first segment and on the lateral margins, yellow or tawny. Outside a line extending from inside the lateral third of the second segment to inside the posterior corners of the fourth segment the pile is subappressed and usually whitish, in specimens with tawny pile on the base and sides, more yellowish. Dorsum of abdomen and the genitalia black pilose. Sternites reduced in size, the third and fourth bearing long black hair, the second with pale hair.

Type, ♂ and two paratypes, Selangor, Bukit Kutu, 3,500 ft., Sept. 14, 1929 (H. M. Pendlebury).

**Azpeytia scutellaris** Walker.

Proc. Linn. Soc. London, viii, 113, 1865.

*Eumerus trepidus* Curran, Journ. F.M.S. Mus., xiv, 1928, p. 195.

This species should be included in the fauna of the Malay States on the basis of the specimen described as *E. trepidus*. All the femora bear a small patch of coarse pubescence basally, indicating its position in the *Eristalina*. This character was overlooked in the original description.

Genus **Mesembrius** Rondani.

Owing to the fact that I do not have females of all the species included in the following key, they have been omitted, with the exception of the two species contained in couplet 4.

#### Table of Species.

1. Middle femora of ♂ with  
strong bare tubercle below  
near the base, strongly  
narrowed apically - - 2.  
Middle femora of ♂ without  
basal tubercle and not con-  
stricted apically - - 3.
2. Middle femora of ♂ with  
mammiiform process at  
point of constriction - *bengalensis*  
Wiedemann.  
Middle femora of ♂ without  
such process - - - *tuberosum* Curran.
3. Large species, over 14 mm.:  
posterior tibiæ ending in  
a long spur - - - 4.  
Smaller species, rarely over  
12 mm. - - - 5.
4. Reddish fascia on second abdo-  
minal segment entire - *gigas* Curran.

Reddish fascia on second abdominal segment interrupted - - - - *insignis* Walker.

5. Posterior femora with numerous long, stiff, black hairs extending along most of the lower surface - - *quadrivittatus* Wiedemann.

Posterior femora with only a few black, bristly hairs apically; middle femora of ♂ with low, bare tubercle on posterior surface near the apex - - - *albiceps* Wulp.

**Mesembrius gigas** Curran.

Journ. F.M.S. Mus., 296, 1928.

♀, Kedah Peak, 3,300 ft., March 19, 1928 (H. M. Pendlebury).

**Mesembrius insignis** Walker.

♂, Saribas, Sarawak, Sept. 18, 1924, (no collector given); ♀, Kedah Peak, 3,950 ft., March 22, 1928 (H. M. Pendlebury).

**Mesembrius bengalensis** Wiedemann.

*Eristalis bengalensis* Wiedemann, Zool. Mag., 1, 3, 1819.

2 ♂, Kedah, Catchment Area near Jitra, April 8, 9, 1928; ♀ Kedah Peak, 3,950 ft., March 22, 1928 (H. M. Pendlebury).

**Genus Keda** gen. n.

Marginal cell closed and petiolate; face without a tubercle, the oral margin produced; third wing vein only moderately curved into the apical cell; mesonotum with yellow pollinose vittæ. This genus resembles *Mesembrius* Rondani but the marginal cell is petiolate and the loop of the third vein is little more than half as deep. The presence of the patch of black setulæ at the base of the anterior four femora indicates its position in the *Eristalinæ*.

Face perpendicular, the oral margin produced and as prominent as the frontal protuberance; sides of face sparsely pilose, front convex, narrow in the female. Antennæ short, the third segment a little longer than wide, obtusely rounded apically; arista subbasal, long and slender. Thorax longer than wide, black, with four yellow pollinose vittæ. Legs simple; femora slender. Third vein gently looped into apical cell; small crossvein oblique, at middle of discal cell. Abdomen as in *Eristalis* Latreille. Genotype, *Eristalis simpliciceps* de Meijere.



**Keda simpliciceps** (de Meijere).

*Eristalis simpliciceps* de Meijere, Tijds. v. Ent., lvii, 146, 1914.

Length, 14.5 mm. (The type was only 11 mm. long).

*Female.* Face, lower seventh of front and the cheeks reddish-yellow in ground color, the face with whitish-yellow pollen and yellow pile, in the middle with a slender black stripe which is broadened below. Front dull black, the sides broadly brownish yellow pollinose; above the antennæ with a shining reddish and black triangle, the black part with a low tubercle in the middle; pile short, black, yellow on the sides of the lower three-fourths. Ocellar triangle slightly longer than wide, situated a little in front of the posterior angles of the eyes. Antennæ brownish, the second segment, lower part of the third and the basal half of the base arista, reddish.

Mesonotum dull black, with four yellowish pollinose vittæ, the outer ones occupying the lateral margins, the inner pair united just in front of the translucent brownish yellow scutellum; median black vitta divided by a slender, inconspicuous pale line, the outer ones sub-shining on the outer half. Pleura cinereous pollinose. Pile short, erect, yellow; apical half of the scutellum with coarser, black hair.

Legs brownish-red; anterior four femora and their tarsi brownish above; posterior legs brown, the base and apex of the femora and almost the whole under surface, basal half of their tibiæ and the whole ventral surface, brownish-red. Hair black; yellowish on the lower basal half of the anterior four femora and the basal third of the posterior pair.

Wings cinereous hyaline; stigma reddish-brown, elongate. Squamæ white, with yellow border and fringe. Halteres yellow.

Abdomen yellow, with black fasciæ. Anterior border of first segment broadly brownish except at the sides. Sub-apical fifth or slightly less of the second segment, produced in the middle as a narrow triangle which extends as a fine line to the narrow, basal brown fascia, black, the basal dark fascia not nearly reaching the lateral margins of the segment. The black fascia on the third segment is equal to two-fifths the length of the segment and the broader median triangle is cut off rather truncately before reaching the base of the segment; the apical fifth of the segment is yellow. Markings of the fourth segment are similar to those of the third. The black fasciæ are opaque, those on the third and fourth segments shining in front. Fifth segment much narrower than the fourth, blackish, the base broadly yellow; a narrow median vitta reddish. Pile short, black on apical half or more of the second and following segments; yellow elsewhere, including the lateral margins

of the fourth segment, that on the apical half of the fifth segment intermixed black and yellow. Entire lateral margin of abdomen shining yellow. Venter wholly yellow and yellow haired.

Described from a single female, Kedah, Alor Star, March 6, 1928, (H. M. Pendlebury).

**Genus *Merodonoides* gen. n.**

Superficially resembling species of *Eristaloides* Rond, but the eyes are bare and the posterior femora are greatly enlarged. Similar to *Tigridimyia* Bigot but at once distinguished by the petiolate marginal cell.

Eyes narrowly contiguous, the vertical triangle very long; face with a low tubercle as in *Eristaloides*, the antennæ as in that genus. Mesonotum short, almost circular from dorsal view; scutellum rather large and transverse. Anterior four femora a little swollen, the posterior pair very strongly swollen, very gently concave below, convex above, bearing a very weak, elongate, convex "plate" on the subapical fifth. Posterior tibiæ laterally compressed, gently arcuate. Wings as in *Eristaloides*. Abdomen much longer than the thorax tapering to beyond the middle, the second segment with a broad, inverted wide V-shaped depression, the third with almost transverse depression in the middle. Genotype, *M. circularis* sp. n.

*Merodon tuberculatus* Brunetti may also belong to this genus.

***Merodonoides circularis* sp. n.**

Thorax cinereous pollinose, with four incomplete shining black vittæ. Length, about 10 mm.

*Male*. Head evidently wholly black in ground color, densely cinereous white pollinose, the occipital pollen with yellow tinge above; vertical triangle opaque blackish-brown above, cinereous yellow on anterior half; facial tubercle narrowly shining black; a triangle on the front of the cheeks less thickly pollinose; a small triangle above the antennæ shining black. Pile whitish, a few hairs on the frontal triangle and the vertical triangle entirely, black. Antennæ brown; third segment narrowly reddish below and basally; arista reddish on more than the basal half, bare. Eyes reddish, the posterior border and two irregular vittæ on the upper half, brown.

Thorax thickly ashy pollinose, the four shining black vittæ all rather narrowly separated from each other, more broadly so from the anterior and posterior margins of the mesonotum. Posterior calli bare. Scutellum reddish. Pile of thorax short, abundant, and erect, whitish.

Anterior four femora black with reddish apices, their tibiæ brown with less than the basal half reddish-yellow. Tarsi black, the basal one or two segments of the middle

pair dull yellowish. Posterior femora reddish on basal half, black on apical half, their tibiæ blackish, the basal third obscurely reddish. Pile of legs short and whitish; black on the "plate" on the hind femora and on the apical one or two tarsal segments.

Wings slightly tinged with luteous, the veins blackish apically, luteous basally; stigma longer than wide, dark brown. Squamæ whitish, with brownish border and yellow fringe. Halteres yellow.

Abdomen rusty reddish, with ferruginous markings. First segment gray pollinose except laterally. Second segment with a narrow, dull black incomplete basal fascia and behind the depression with a dull ferruginous triangle which is produced to form an obscure, incomplete preapical fascia. The third segment bears a similarly colored, incomplete fascia beyond the middle. The basal two-thirds of the fourth segment and the genitalia are ferruginous. Pile short, pale yellowish, on the sides and apex longer and whitish. Venter rusty reddish.

Described from one male, Kedah Peak, 3,300 ft., March 19, 1928 (H. M. Pendlebury).

#### Genus *Lathrophthalmus* Mik.

##### Table of Species.

- |  |                                  |
|--|----------------------------------|
| 1. Scutellum shining black - -   | 2.                               |
| Scutellum reddish or yellowish - - - -   | 3.                               |
| 2. Mesonotum with four cinereous vittæ, the outer ones sub-lateral - - -                               | <i>nigroscutatus</i> de Meijere. |
| Mesonotum wholly without pale vittæ - - -  | <i>selectans</i> sp. n.          |
| 3. Femora mostly reddish, sometimes blackish on apical half; pale abdominal spots widest laterally - - | <i>arvorum</i> Fabricius.        |
| Femora blackish except their apices, pale abdominal spots widest toward the middle of the abdomen -    | <i>obliquus</i> Wiedemann.       |

*Lathrophthalmus arvorum* Fabricius.

*Syrphus arvorum* Fabricius, Mant. Ins., 335, 1787.

3 ♀, Kedah Peak, 3,000-3,300 ft., March 8, 12, 26, 1928 (H. M. Pendlebury).

*Lathrophthalmus selectans* sp. n.

Shining black, the abdomen mostly opaque and bearing four small, cinereous pollinose spots; sides of mesonotum cinereous white pollinose in front of the suture. Length, 9 mm.

*Male.* Sides of face rather narrowly, the lower third except in the middle, linear frontal orbits and the posterior orbits on the lowest three-fourths, cinereous white pollinose. Face gently concave above, the large, shining black tubercle situated below the middle. Pile moderately long and white; short and white on the posterior orbits. Frontal triangle shining, with a moderately large tubercle in the middle, the pile black. Vertical triangle short, opaque in front of the equilateral ocellar triangle, black pilose, the occipital cilia black. Antennæ brownish, the third segment paler below on basal portion; arista distinctly pubescent. Eyes with yellowish pile on upper half.

Thorax shining black, the pleura broadly in front and below, the humeri and a broad sub-lateral vitta in front of the suture, sericeous pollinose. Pile rather short and black, the pale pollinose parts of the pleura and the anterior border of the humeri with yellowish pile. Pile very dense on the notopleura laterally and above the base of the wings. A few of the marginal hairs on the shining black scutellum are also yellowish.

Legs black, the extreme tips of the femora, bases of the tibiæ and the first tarsal segment on the anterior four legs more or less reddish. Pile black, yellow on the posterior surface of the middle and ventral surface of the posterior femora. Femora and posterior tibiæ only a little enlarged.

Wings tinged with luteous. Stigma luteous with brown spot at base, the subcostal cell mostly brown before the stigma. Squamæ brown, with brownish-yellow fringe. Halteres yellow.

Abdomen opaque black with shining areas and four cinereous pollinose spots. Second segment with a small, shining black triangle on either side. Third segment with a subtriangular shining black spot in the middle on either side, the inner ends rounded, the outer end produced narrowly to the apex of the segment; in the middle with a pair of very broadly separated, small, longitudinally placed cinereous pollinose spots. Fourth segment with a still larger, lateral triangle which reaches the apex of the segment at the sides and is narrowly separated from the base except at its outer end; on the disc with a pair of widely separated cinereous pollinose vittæ extending from near the base of the segment to the apical fourth, the apex of the segment broadly shining black. Genitalia shining black, thinly brown pollinose. Pile short, yellowish; black on the second and third segments except large basal triangles on the second and around the cinereous spots on the third; longer on the lateral margins, apical segments, genitalia and the shining black venter.

Described from a single male, Selangor, Bukit Kutu, 3,500 ft., April 17, 1926 (H. M. Pendlebury).

Genus *Eristalis* Latreille.

## Table of Species.

- |    |  |   |   |   |   |                                 |
|----|--|---|---|---|---|---------------------------------|
| 1. | Eyes pilose  | - | - | - | - | 2.                              |
|    | Eyes bare  | - | - | - | - | 5.                              |
| 2. | Face with a broad shining black vitta  | - | - | - | - | 4.                              |
|    | Face wholly pollinose, the tubercle sometimes partly bare                          | - | - | - | - | 3.                              |
| 3. | Middle of face black pilose above; eyes black pilose on upper fourth or more       | - | - | - | - | <i>cerealoides</i> sp. n.       |
|    | Face and eyes wholly yellowish pilose  | - | - | - | - | <i>cerealis</i> Fabricius.      |
| 4. | The yellow spots on the second abdominal segment do not reach the posterior border | - | - | - | - | <i>simplicipes</i> Curran.      |
|    | The yellow spots on the second segment are very connected with those on the third  | - | - | - | - | <i>hortorum</i> Fabricius.      |
| 5. | Scutellum blackish   | - | - | - | - | 6.                              |
|    | Scutellum reddish  | - | - | - | - | 9.                              |
| 6. | Pile of mesonotum black except on the sides in front                               | - | - | - | - | <i>perakensis</i> Curran.       |
|    | Pile much more extensively whitish or yellow                                       | - | - | - | - | 7.                              |
| 7. | The opaque black on the base of the second segment reaches the lateral margins     | - | - | - | - | 8.                              |
|    | The opaque black is rather broadly separated from the lateral margins              | - | - | - | - | <i>purus</i> Curran.            |
| 8. | Anterior femora wholly pale pilose   | - | - | - | - | <i>penangensis</i> sp. n.       |
|    | Anterior femora black pilose on upper surface                                      | - | - | - | - | <i>niger</i> Wiedemann.         |
| 9. | Wings hyaline  | - | - | - | - | <i>collaris</i> de Meijere.     |
|    | Wings with a large sub-quadrate brown spot beyond the middle                       | - | - | - | - | <i>quadrangulum</i> de Meijere. |

*Eristalis cerealis* Fabricius.

Syst. Antl., 232, 1805.

*E. solitus* Walker. List. Dipt. Brit. Mus., iii, 619, 1849.

♀, Pahang, Gunong Benom, 6,000 ft., at light, Aug. 5, 1925 (I. H. N. Evans). ♀, Sarawak, April 1913. Also a ♂ from Darjeeling, Dec. 6, (T. D. A. Cockerell).

The species is common and widely distributed in the Oriental Region.

***Eristalis horticola* De Geer.**

*Musca horticola* De Geer, Mem. pour serv. l'hist. Ins., vi, 140. Pl. viii, f. 12, 13, 1776.

? *Eristalis basifemoratus* Brunetti, Fauna Brit. India, Dipt., iii, 175, 1923.

♂, Malay Peninsula, ex Coll. Agric. Dept.

The specimen has been labelled *horticola* and I can see no difference between it and European examples. I believe that *basifemoratus* Brunetti is based upon a female of this species.

***Eristalis quadrangulum* de Meijere.**

Tijd. v. Ent., lviii, Suppl. p. 33, 1916.

*Eristalis maculipennis* Brunetti (not de Meijere) Fauna Brit. India., Dipt., iii, 167, 1923.

♀, Selangor, Bukit Kutu, 3,500 ft., April 13, 1926; ♀, Kedah Peak, 3,000 ft., March 13, 1928 (H. M. Pendlebury).

I do not know whether this species is distinct from *maculipennis* de Meijere, but the latter is described as having a black mesonotum while the specimens before me have the mesonotum yellowish brown pollinose or even paler. They therefore agree with Brunetti's description, and, of course, with de Meijere's description of *quadrangulum*.

***Eristalis penangensis* sp. n.**

Related to *niger* Wiedemann but considerably larger and with metallic green abdomen and wholly yellow pilose anterior femora. Length, 15 mm.

*Female*. Head black; face cinereous white pollinose, a broad median vitta which is thinly pollinose in the depression and a large triangle on the front of the cheeks, shining black. Front narrow (considerably longer and narrower than in *niger*), gently widening anteriorly, across the anterior fifth with a broad shining greenish band the anterior fourth shining black and bearing a low rounded tubercle; pile short and black. Occiput cinereous white pollinose, the occipital cilia black, the pile whitish. Facial pile whitish, the tubercle large and broad, the face deeply concave above, almost perpendicular below. Antennæ brown, the arista with very short rays.

Mesonotum opaque black, with a broad cinereous fascia immediately in front of the suture. Pile brassy yellowish, black behind the suture except for an incomplete prescutellar band and on the outer surface of the posterior

calli. Pleura mostly cinereous pollinose, black on upper half in front and posteriorly. Scutellum dull black, the free border broadly metallic dark greenish. Pile brassy yellow.

Legs black; tips of femora reddish; basal half of anterior four and one-third of the posterior tibiae, yellow. Pile brassy yellow, black on the tarsi.

Wings tinged with brown, darker anteriorly. Squamae and halteres bright reddish-yellow.

Abdomen metallic green with opaque black markings. First segment with abundant, appressed, outwardly directed brassy yellow pile except laterally. Second segment with the apical fourth and a slender median triangle reaching to the base, opaque black, a small median apical triangle metallic green. Third segment with a broad opaque black fascia behind which is a transverse metallic triangle which does not nearly reach the lateral margins; in front with a narrow black vitta extending to the base; fourth segment rather similarly marked but the posterior green triangle is wider, the opaque black therefore forming a broad A-shaped fascia which is connected with the base by a linear projection. Fifth segment shining black apically. Pile brassy yellow; shorter and black on the opaque black markings on the second and third segments, at least toward the sides. Venter black, the apices of the segments reddish.

Described from one female, Penang Id., 1,500–2,428 ft., May 1911. (R. Hanitsch.)

The specimen is not in first-class condition but all the characters, with the exception of the extent of the black pile on the abdomen, may be readily discerned.

**Axona chalcopyga** Wiedemann.

*Eristalis chalcopygus* Wiedemann, Ausser. Zweifl., ii, 178, 1830.

♂ ♀, Kedah Peak, 3,000–3,500 ft., March 8, 15, 1928 (H. M. Pendlebury).

### Genus **Megaspis** Macquart.

There are two species in the collection, both of which were described in my previous paper.

**Megaspis chrysopygus** Wiedemann.

*Eristalis chrysopygus* Wiedemann, Zool. Mag. i, 3, 1819.

♀, Malay Peninsula West Coast, Langkawi Island, April 14, 1928 (H. M. Pendlebury).

**Megaspis errans** Fabricius.

*Syrphus errans* Fabricius, Mantis, Ins., ii, 337, 1787.

♂ 2 ♀, Malay Peninsula West Coast, Langkawi Island, April 19, 24, May 1; ♂ ♀, Kedah, Catchment Area, near Jitra, April 8, 11, 1928, (H. M. Pendlebury).

XVII.—RECORDS AND DESCRIPTIONS OF SYRPHIDÆ  
FROM NORTH BORNEO, INCLUDING  
MT. KINABALU.

By C. H. CURRAN.

*American Museum of Natural History, New York, U.S.A.*

In the preceding paper (pp. 290–338) I have dealt with the *Syrphidæ* from the Malay Peninsula, including in the keys the species occurring in the present collection. As may be expected, many species are common to the two regions while many others are known to occur in the Dutch East Indies. It seems probable that increased collecting will result in the extension of the range of many of the forms known from only a single locality and that eventually the number of species indigenous to the Peninsula and Islands will be very greatly increased.

This report deals with two collections, a lowland one made in 1927 by Messrs. C. Boden Kloss and H. M. Pendlebury, a mountain one by Mr. Pendlebury in 1929. A survey of the specimens contained in the collections indicates two very different faunas, each typical of the environmental conditions under which the species occur. Owing to the obvious differences in the two localities (only a few specimens are from outside the two main regions), I have requested that there may be appended a description of the regions in which the collections were made.

[A collecting visit to the lowlands of British North Borneo was undertaken by the Raffles Museum, Singapore, Straits Settlements, and the Federated Malay States Museums between June and September 1927.

The bulk of the collections was made on the North East coast (1) in high forest and clearings at Bettotan, which is about twenty-two miles west-by-south of Sandakan; and (2) in small patches of forest in swampy country at Samawang which is about twenty-five miles west-by-north of Sandakan and on the South coast of Labuk Bay. Other localities visited, such as Kudat, Labuan Id. &c. are well known places.

A second visit was paid by the same Museums to British North Borneo between the beginning of March and the end of May, 1929, this time to Mt. Kinabalu, the highest mountain in Malaysia, which is 13,455 ft. in height.

Collecting was chiefly carried out at the higher altitudes, but hardly anything was found above the tree limit which varies from about 11,000 ft.—12,000 ft. A scanty fauna occurs between **Pakka Cave** (about 10,200 ft.) and the tree limit; the vegetation hereabouts is stunted, except in some of the more sheltered spots, and decreases rapidly in size as it approaches the tree limit. *Syrphidæ* were only



seen during sunny intervals; five species were taken, of which two were found lower down the mountain. The temperature was low, and the ground was always in a thoroughly saturated condition as rain fell daily from before midday until late into the night.

**Kamborangah** is a narrow, rather exposed, ridge at about 7,200 ft. The forest consists of fairly tall trees of essentially montane type. Nine species of *Syrphidæ* were found here, of which five were found elsewhere.

**Lumu Lumu** about 5,500 ft., a rather wider ridge than Kamborangah and a typical 'mossy forest' area which is kept continually damp with mists and rain through which the sun rarely penetrates: hence the scarcity of *Syrphidæ* of which only seven species were found, four of which occurred elsewhere.

**Tenompok Pass** 4,700 ft. A narrow pass through which runs the bridle path from Kotabelud—Kabayau—Dallas to Bundu Tuhan and the interior. Part of a day was spent here on the outward journey. Four species of *Syrphidæ* were collected, two of which were found in other localities.

**Kiau** is a village occupied by Dusuns at about 3,000 ft. on the south-western spur of the mountain. The forest has at one time or another been cleared all round the village and up to nearly 4,000 ft. Some patches of secondary growth have sprung up.

**Kenokok** (or Penokok) about 3,300 ft., a good area of jungle at the head of the Kenokok valley which is the next valley north of Kiau. Most of the jungle below 3,000 ft. has been cleared here, and much of the land has been, or is under cultivation by the Dusun natives. This locality produced seven species of *Syrphidæ*, five of which were not found elsewhere.

**Marei Parei** A spur below the western peaks of Mt. Kinabalu at about 5,000 ft. Vegetation on the spur itself is scanty and the ground which consists of only a shallow layer of soil over rock, is sodden. Twelve species of *Syrphidæ* were taken here, six of which were taken in other places during the visit to the mountain.

**Kabayau** 600 ft. A resthouse about eighteen miles from Kotabelud, on the bridle path to Kinabalu. Much of the original jungle has been cleared. Eight species of *Syrphidæ*, mostly lowland forms, were found during the few days spent here on the return journey. H. M. Pendlebury].

#### CERIOIDINÆ.

##### Genus *Cerioides* Rondani.

##### *Cerioides anchorata* Bigot.

*Sphiximorpha anchorata* Bigot, Ann. Soc. Ent. France, p. 318, 1883.

Three ♂, Bettotan, near Sandakan, July 28, August 12, 19, 1927, (Kloss and Pendlebury).

A beautiful large species. Bigot's description is exceedingly poor and the Latin and French portions disagree in a surprising manner. The face is yellow with a black median stripe, although in the French diagnosis it is stated to be black; the squamæ are yellow with brown base, not brown with yellow border, etc. The legs are variegated black, ferruginous and yellow. The second abdominal segment is half as long as the entire abdomen and very slender for most of its length. The pleura bear three contiguous yellow spots.

This species agrees closely with the description of *C. javana* Wiedemann but that species has brown squamæ with white border and fringe. I believe that Bigot had two species confused and hold the name *anchorata* to the Latin description, the French description applying fairly well to *javana*.

#### MICRODONTINÆ.

##### Genus *Microdon* Meigen.

Five species were taken during the collecting in Borneo. They are included in the key given in the part of this paper dealing with the Malay Peninsula species.

##### *Microdon latiscutellaris* sp. n.

Related to *stilboides* Walker but at once distinguished by the yellow pilose sides of the fourth and whole of the fifth abdominal segment. Length, about 12 mm.

*Female*. Green, more or less brassy. Head white pilose, the front black haired except across the obscure depression. Front a little narrower than the face, its sides diverging below the middle, ocellar triangle small, equilateral, situated at the upper third of the front. Face scarcely narrowed below, gently convex, strongly so below. Antennæ long, blackish, the third segment one-sixth longer than the first, the second one-fourth as long as the third; arista much shorter than third segment. Eyes with sparse, short, white pile.

Thorax with a narrow band of yellowish or whitish pile in front and on the sternopleura, otherwise black pilose, the pile not at all dense.

Legs steel-blue; posterior four coxæ and trochanters yellowish pilose, the pile otherwise black. Anterior and posterior tarsi broadened, especially at the base.

Wings dark brownish or blackish, paler posteriorly, the apical crossvein with two appendagts. Squamæ and fringe brown. Halteres pale yellowish,

Abdomen brassy, short black haired, sides of third segment posteriorly, very broad sides of fourth and whole of fifth, pale yellowish haired, the second with considerable obscure whitish pile in the middle. Apices of sternites reddish, the pile partly yellow.

Holotype, ♀, Bettotan, near Sandakan, N. Borneo, August 14, 1927, (C. Boden Kloss and H. M. Pendlebury).

**Microdon minuticornis** sp. n.

A small blackish species, fairly robust, the abdomen with steel-blue reflections, the second and third segments in part yellow dorsally; apical crossvein rectangular, straight; antennæ shorter than length of head. Length, 6 to 8.5 mm.

*Female.* Head black, rather dull, luteous pilose, a broad band of blackish pile across the upper part of the front and an incomplete one above the antennæ. Face and front narrow, the former narrowest below, the front with gently diverging sides on the lower two-thirds; ocellar triangle a little longer than wide, situated at upper third of front. Face receding, gently convex. Third antennal segment longer than first two combined, brown; second scarcely longer than wide, black; first shining black, with black hair in outer dorsal surface; arista shorter than third segment. Eyes bare.

Thorax shining blackish, with reddish tinged cinereous pile, on the disc of the mesonotum a patch of blackish pile visible in some lights. Scutellum with the apex rather narrowly and shallowly emarginate without spines.

Legs black; tips of femora, basal third of anterior four and fourth of posterior tibiæ, tips of the tibiæ and the tarsi reddish or reddish-yellow, the tarsi becoming brown apically on upper surface. Legs black haired, the coxæ with more or less white pile.

Wings cinerous hyaline, the veins more or less clouded with brownish. Apical crossvein transverse, with an appendage at its origin. Squamæ white; halteres pale yellowish.

Abdomen black; second segment with a pair of large posterior yellow triangles occupying most of the dorsum: they are connected posteriorly and usually leave only a small, oval, spot of black in the middle anteriorly; third segment with much smaller yellowish posterior triangles which do not reach the base of the segment. Pile black; on the posterior border of the second to fifth segments with a very broad, broadly interrupted band of yellowish pile, the second segment mostly pale pilose, the band on the fifth segment very broad and only narrowly interrupted.

**Male.** The head is missing. Second abdominal segment brownish-red. The pale pilose fascia on the fourth segment is in the form of two large, slightly oblique oval spots, the apex of the segment reddish. Hind tarsi not unusually large.

Holotype, ♀, Bettotan, near Sandakan, N. Borneo, July 30, 1927. Two females taken at the same place on August 20th are teneral, while a ♂, July 30, lacks its head. (Kloss and Pendlebury); allotype, ♂, Mt. Kinabalu, Kiau, 3,000 ft., March 16, 1929, (H. M. Pendlebury).

***Microdon wulpî* Mik.**

Ent. Zeitg., xviii, 143, 1899.

*Microdon apicalis* Wulp, Dipt. Sumatra Exp., 29, 1881.

N. Borneo, Kudat, Sept., 17th 1927, (Kloss and Pendlebury).

***Microdon klossi* sp. n.**

An elongate rather slender species with golden yellow fasciæ on the thorax and abdomen, the ground color blackish; legs reddish; eyes pilose; scutellar spines very small. Length 10.5 to 12 mm.

**Male.** Head with slight metallic green tinge, golden yellow or brassy pilose, a broad band at the vertex and the first two antennal segments with black pile. Face broadly yellow on the sides except above, slightly narrowing below. Front narrow, narrowing to the suture, below the suture black pilose except along the orbits; ocellar triangle longer than wide, small, situated a little before the posterior angles of the eyes. Face gently convex in profile. Proboscis yellow. Antennæ elongate, black, the third segment brown, the first as long as the apical two together, the second three-fifths as long as the third; arista mostly reddish, brown apically, shorter than third segment.

Mesonotum with three broad bands of golden or brassy-yellow pile, the first on the anterior border, second in front of the suture, the third before the scutellum, the median band connected with the anterior one at the sides and running down over the meso- and sterno-pleura; scutellum with similar pile which is more abundant on the border, the base and two bands on the mesonotum black pilose; apex of the scutellum more or less reddish.

Legs reddish; posterior femora black or brown; coxæ brown. Hair of legs short, yellowish.

Wings greyish hyaline, the crossveins and spur in apical cell bordered with brown, the veins brown. Apical and discal crossveins slightly curved, a little recurrent, rather sharply rounded posteriorly. Squamæ and halteres yellow, the former with yellow fringe.

Abdomen gently narrowing posteriorly, obtuse behind, the second segment widest, in its middle not more than half as long as at its sides, the first segment as long in the middle as the second. Sides of second segment more or less metallic greenish; apices of second to fourth segments rather broadly reddish. Pile short, black on the dorsum; second segment wholly, broad sides of the third and fourth, extending inwardly basally, broad posterior border of the third and almost the apical half of the fourth brassy-yellow or golden-yellow pilose, the pale pilose bands on the apices of the third and fourth segments deeply notched in the middle anteriorly and narrowed towards the sides. Genitalia and venter brownish.

Holotype, ♂, Bettotan, near Sandakan, N. Borneo, August 16, 1927.

Paratypes 24 males, same locality, August 15 to 20, 1927. All were collected by Messrs. C. Boden Kloss and H. M. Pendlebury.

*Microdon stenogaster* sp. n.

A peculiar elongate species with brownish wings, the abdomen very long and narrow, with almost parallel sides beyond the second segment, the fourth segment sub-cylindrical and as long as the two preceding combined. The general habitus is much like that of *Syrphinella* Hervé-Bazin but the characters are those of the *Microdontinae*, that is, the elongate first antennal segment, presence of stump of vein extending into discal cell, etc. In the female the fourth and fifth segments are separated by a true suture and the fourth segment has the sides gently convex. Length, 12.5 to 15 mm.

*Male.* Head bluish to violaceous in ground color, pale yellowish pilose, the occiput above and the front with black pile, the sides of the front below the suture and a band across the suture, pale haired, only a very few black hairs below the suture. Front narrowest at the suture which is located at the anterior fourth, gently widening to the vertex, scarcely so anteriorly, the face gently widening below. Ocellar triangle situated near middle of upper section of front, small, longer than wide. Face with a large, low swelling below antennæ, receding, almost straight, gently convex above the oral opening. Labellæ reddish. Antennæ black, with short black hair, longer than the face, the first segment as long as the two following combined, the second one-fourth as long as the third; arista rather thick, brown, not as long as third segment. Eyes bare.

Thorax blackish with steel-blue reflections; moderately pilose, the pile pale yellowish, becoming paler on the lower part of the pleura, black on the apical third of the scutellum. Scutellum without distinct spines but the apex rather deeply and narrowly excavated.

Legs black, the femora more or less steel-blue; whitish pilose, the apical third of the femora, the anterior four in front and the tarsi black haired, the anterior four tarsi white haired in front except apically. Pile long and silvery on the tibiæ. Apical fourth of front tibiæ and the anterior four tarsi rather reddish.

Wings brownish, the second basal cell and the area behind cinereous hyaline. Squamæ whitish, the border with brown tinge, the fringe tinged with yellow. Halteres yellow.

Second and third abdominal segments reddish-brown, more or less greenish or bronzed, the first and fourth segments brown, with metallic reflections. Pile whitish, long on lateral margins, black on the apex of the fourth segment. The second segment is widest near its anterior end, gently narrowing posteriorly, in the middle shorter than the third segment but more than twice as long as the first, which is grey pollinose dorsally. Genitalia brownish, black pilose. Venter reddish-brown, pale pilose, some black pile apically.

*Female.* Front with almost parallel sides very gently widening above the depression which lies above the anterior third. Anterior four tibiæ more reddish, their tarsi reddish. Abdomen darker, more nearly unicolorous, with only a little black pile apically, the third and fifth segments of nearly equal length, the fourth considerably longer than either.

Holotype, ♂, Bettotan, near Sandakan, N. Borneo, August 18, 1927.

Allotype, ♀, Samawang, near Sandakan, in jungle, July 9, 1927.

Paratypes, ♀, same data as allotype but July 14; 35 males, Bettotan, August 14 to 24, 1927. All the specimens were collected by Messrs. C. Boden Kloss and H. M. Pendlebury.

#### VOLUCELLINÆ.

##### Genus *Volucella* Geoffroy.

##### *Volucella trifasciata* Wiedemann.

Ausser. Zweifl., ii, 196, 1830.

♀, Bettotan, near Sandakan, August 4, 1927, (Kloss and Pendlebury).

#### MILESINÆ.

##### Genus *Milesia* Latr.

##### *Milesia insistens* sp. n.

Related to *reinwardtii* Wiedemann but the wings are pale blackish-brown, not at all yellowish, etc. Face black in the middle and below. Length, 16 to 19 mm.

*Male.* Head black, the sides of the face very broadly reddish on the upper half to two-thirds; a rectangular spot

above the antennæ, a broad median facial stripe, oral margin broadly and the cheeks anteriorly, shining black. Head pale yellowish-cinereous pollinose and with yellowish pile; upper part of occiput and the vertical triangle brownish pollinose and black pilose, the vertical triangle yellow pollinose in front of the ocelli. Face in profile deeply concave, the oral margin almost or quite as prominent as the antenaral base. Antennæ black; third segment slightly longer than wide; arista ferruginous.

Mesonotum opaque black, with three broad yellow fasciæ, the anterior two, on the anterior margin and across the suture, moderately interrupted the prescutellar fascia entire; pile concolorous. Pleura dull black, the propleura, a median band and an oblique band extending from the squamæ to the sternopleura, yellow or yellowish-gray; pile yellow. Scutellum shining black, the free border yellow; hair black, the ventral fringe yellow.

Coxæ black, yellow pollinose and pilose. Femora black, the apical third or more of the anterior four and the apex of the posterior pair, reddish. Tibiæ reddish-yellow, the posterior pair with the median fourth to third black. Anterior and posterior tarsi black, with the apical one or two segments reddish; middle tarsi reddish-yellow. Pile of the femora moderately long, yellow, black on the apical fifth of the posterior pair and on the under surface of the slightly broadened anterior pair. Tibial pile pale brassy-yellow, short and appressed, the middle and hind pair with many long, yellow hairs posteriorly, the posterior pair mostly black haired on the basal half. Tarsi yellow haired, the black segments with black hair. Posterior femora with strong spur.

Wings strongly tinged with brownish-black, somewhat darker in front. Squamæ and fringe yellow. Halteres reddish-yellow, with pale knob.

Abdomen black, with three interrupted yellow or orange fasciæ and an entire apical fascia. First segment more or less metallic bluish. The pale fascia on the second segment occupies more than the sub-basal half of the segment, reaches the base of the segment narrowly at the sides, is widest near the middle and is narrowly separated from the base of the segment; the segment is wholly opaque and the pale spots are separated by a narrow, subtriangular median stripe. The pale fascia on the third segment is sub-basal, narrowly interrupted, strongly widened at the lateral margins where they reach the base of the segment, their width at the middle equal to about one-fourth the length of the segment. Pale fascia on base of fourth segment about the same as the preceding but more strongly widened laterally. Apically the fourth segment bears a broad, transverse shining reddish fascia which is narrowly separated from

the apex and lateral margins and is usually more or less triangularly produced medianly. Pile black, yellow on the dull yellowish fasciæ and on the entire lateral margins. Broad apex of the third segment and the apical half of the fourth, shining. Venter yellow, the third sternite with a large, black transverse apical triangle, the fourth wholly black; pile yellowish. Genitalia shining blackish, black haired.

*Female.* Front dull blackish-brown, the sides very broadly bright yellow to opposite the ocelli. The shining black spot above the antennæ is fully twice as large as in the male. Femora more extensively reddish, with only a few, obscure short black hairs beneath the front pair; tibiæ without long hair. Fifth segment shining black.

Described from 4 ♂ 4 ♀, Mt. Kinabalu, Lumu Lumu, 5,500 ft., April 8 to 16, 1929 and ♂ ♀, Mt. Kinabalu, Kamborangah, 7,200 ft., April 1, 3, 1929 (H. M. Pendlebury). The holotype ♂ and allotype were taken at Lumu Lumu on April 16.

***Milesia metallica* sp. n.**

Related to *dorise* Rondani but the abdomen is entirely black; wings tricolored. Length, about 21 mm.

*Male.* Face pale orange, pale yellowish pollinose. Cheeks mostly shining black. Frontal triangle shining black, the sides broadly and the upper angle narrowly yellow pollinose. Face with obscure, sparse yellowish hair; front bare. Vertical triangle bluish-black, yellow pollinose and pilose on the anterior half, black pilose above, very long, the eyes only narrowly contiguous. Posterior orbits deep yellowish pollinose, yellow pilose, with some short black hairs above. Antennæ brown; first segment and the third ventrally brownish-red; third segment twice as long as wide; arista brownish-yellow on basal half, darker apically.

Thorax blackish, with a pair of obscure, broadly separated, brownish-gray vittæ which taper posteriorly, reaching from the anterior border to the posterior fourth, and, like the spot inside the humeri, visible only from posterior view. Pile very short and tawny, with some black hair intermixed. Pleura blackish, thinly brown pollinose, with an obscure brownish-gray fascia extending over the mesopleura and sternopleura and a more grayish but less distinct one beneath the wings, the pile pale tawny. Scutellum bluish-black, the narrow, impressed margin brown; pile sparse and yellow.

Legs brown, knees reddish, tarsi black, anterior four tibiæ rather silvery. Pile of anterior four femora black above and below, brownish-red in front, posteriorly and apically; posterior femora rather tawny pilose. Tarsi black haired, anterior four tibiæ with bright yellow pile, the



posterior pair tawny pilose. The posterior four tibiae have only a few somewhat longer hairs behind, posterior femora with a strong reddish spur.

Wings yellowish, broadly gray behind, the apical fifth brown. Squamæ grayish-yellow, with brown border and fringe. Halteres reddish-yellow.

Abdomen metallic blackish-blue, with opaque black markings. Second segment with the base narrowly and a broad fascia lying almost wholly before the middle and connected to the anterior fascia by a narrow line, opaque black, both opaque fasciæ very broadly separated from the lateral margins. Third segment with similar fasciæ, but they are not connected in the middle and the posterior one, while narrower, is less rounded apically. Pile tawny, on the apical segments almost golden, reddish-yellow basally; across the apex of the second segment broadly black, on the third erect on the basal half, on the apical half longer and appressed, on the fourth segment almost wholly appressed. The erect pile is paler than the depressed. The pile is short; long and crinkly on the sides. Venter bluish-black, with long black pile. Genitalia brownish-black, with black pile.

One ♂, Bettotan, near Sandakan, August 9, 1927, (Kloss and Pendlebury).

This species is elongate and rather slender, the abdomen with almost parallel sides.

*Milesia tenuiformis* Curran.

Journ. F.M.S. Mus., xiv, 176, 1928.

2 ♂, Kudat, Sept. 15, 18, 1927; 2 ♀, Bettotan, near Sandakan, August 16, 21, 1927, (Kloss and Pendlebury).

#### EUMERINÆ.

##### Genus *Eumerus* Meigen.

*Eumerus splendens* Wiedemann.

Ausser. Zweifl., ii, 114, 1830.

Three males, Bettotan, near Sandakan, August 13, 19, 23, 1927; 4 ♂, Samawang, near Sandakan, July 12, 15, 1927 (Kloss and Pendlebury).

*Eumerus deceptor* Curran.

Journ. F.M.S. Mus. xiv, 190, 1928.

Male, Bettotan, near Sandakan, August 12, 1927 (Kloss and Pendlebury); ♂, ♀, Mt. Kinabalu, Kenokok, 3,300 ft., April 24, 1929; 2 ♂, near Kinabalu, Kabayau, 600 ft., May 8, 1929 (Pendlebury).

*Eumerus marginatus* Grimshaw.

Fauna Hawaiiensis, iii, 82, 1920.

Male, Bettotan, near Sandakan, Aug. 3, 1927; ♀, Kudat, Sept. 3, 1927 (Kloss and Pendlebury).

**Eumerus auratus** Walker.

*Citibaena auratus* Walker, Proc. Linn. Soc. Lond., i, 124, 1857.

This genus, and species, was originally described from Borneo. It is impossible to determine whether the description applies to *spendens*, *deceptor* or *aurifrons* Wiedemann.

## SYRPHINÆ.

Genus **Syrphus** Fabricius.

## A. Eyes bare.

**Syrphus viridaureus** Wiedemann.

Anal Ent., 35, 1824.

4 ♀, near Kinabalu, Tenompok Pass, 4,700 ft., March 18, 1929; ♀, Mt. Kinabalu, Kiau, 3,000 ft., April 30, 1929 (H. M. Pendlebury); ♀, Kudat, Sept. 17, 1927, (Kloss and Pendlebury).

**Syrphus peteus** sp. n.

Related to *tenuiformis* Curran but with an entire yellow fascia on the second abdominal segment. Length, about 9 mm.

*Female*. Face and cheeks reddish-yellow, the former ochre-yellow pollinose and with a broad, shining brown stripe reaching almost to the antennæ. Face perpendicular, with a long, low, nasiform tubercle. Front brownish with blue reflections, the sides very broadly ochreous pollinose almost to the level of the ocelli, the frontal prominence black. Pile yellow; on the front black, the occipital cilia also black. Antennæ reddish, the basal two segments brown above, the third black above, one-half longer than wide, almost evenly rounded apically. Arista luteous, the apical third black.

Thorax metallic greenish-black, the sides of the mesonotum broadly brownish-yellow pollinose in front of the suture. Humeri, notopleura and posterior calli brownish-yellow. Mesonotum with cinereous pile. Pleura yellowish-gray pollinose and yellow pilose. Scutellum reddish-yellow, with sparse black pile.

Anterior four legs reddish-yellow, and yellowish haired. Posterior legs black, the broad base and apex of the femora and the base of the tibiæ reddish, hair black.

Wings cinereous hyaline, narrowly darker in front and apically. Squamæ and halteres reddish-yellow.

First abdominal segment yellow, with a broad, black spot in the middle. Second segment with an incomplete basal black fascia which is widest in the middle, and a shallow posterior triangle which reaches forward almost to the middle of the segment and extends broadly to the latera!

margins, the yellow fascia narrowest in the middle. Third segment with an incomplete, narrow basal black fascia and the apical half of the segment black; in the middle the posterior black band extends forward to a little in front of the middle; laterally it occupies little more than the posterior two-fifths of the segment. Fourth segment similar to the third except that the yellow fascia is slightly narrower, the basal black fascia is entire and the lateral margins appear to be very narrowly black. Fifth segment with a large, reddish, triangular spot toward either side, basally. Pile short, black; on the base of the abdomen and opposite the yellow fasciæ, yellow. Venter wholly yellowish, with black hair on the apical half.

Type, ♀, Mt. Kinabalu, Lumu Lumu, 5,500 ft., April 15, 1929 (H. M. Pendlebury).

**Syrphus malayensis** Curran.

Journ. F.M.S. Mus., xiv, 224, 1928.

4 ♂, Mt. Kinabalu, Lumu Lumu, 5,500 ft., April 16, 17, 1929; 3 ♂, Mt. Kinabalu, Kamborangah, 7,200 ft., March 29, 31, April 1, 1929 (H. M. Pendlebury).

**Syrphus tenuiformis** Curran.

Journ. F.M.S. Mus., xiv, 222, 1928.

♂, Mt. Kinabalu, Kamborangah, 7,200 ft., March 29, 1929 (H. M. Pendlebury).

**Syrphus deceptor** Curran.

Journ. F.M.S. Mus., xiv, 219, 1928.

2 ♂, Mt. Kinabalu, Kamborangah, 7,200 ft., March 27, 1929 (H. M. Pendlebury).

**Syrphus clarus** Hervé-Bazin.

*Olbiosyrphus clarus* Hervé-Bazin, Bull. Soc. Ent. Fr., 25, 1923.

3 ♂, Mt. Kinabalu, Kenokok, 3,300 ft., April 24, 25, 1929 (H. M. Pendlebury).

This species is very close to *luteifrons* de Meijere, but differs in the much wider spots on the second abdominal segment.

**Syrphus circumdatus** de Meijere.

Tijd. v. Ent. li, 306, 1908.

♀, M. Kinabalu, Kamborangah, 7,200 ft., March 30, 1929 (H. M. Pendlebury).

Related to *harvé-bazini* Curran but there is an entire yellow fascia on the second abdominal segment instead of a pair of spots.

**Syrphus kinabalensis** sp. n.

Related to *circumdatus* de Meijere but with only a pale brownish spot on the middle of the scutellum instead of the

basal black triangle. Pale band on second abdominal segment broadly interrupted in the male, entire in the female. Length, 12 to 13 mm.

*Male.* Face and cheeks pale orange, the latter with a large blackish spot on the jowls, the former with a median black vitta extending from the oral margin to the antennae, but paler above. Face wholly shining; cheeks with thin pale pollen. Frontal triangle orange, dull, with a large shining black spot in front. Vertical triangle black, thinly brown pollinose, black pilose. Pile of the head black, on the lower three-fourths of the occiput and on the cheeks, pale yellowish; occiput silvery gray pollinose. Face perpendicular, shallowly concave above, shortly but rather deeply concave below the long, nasiform tubercle. Antennae reddish-brown, the third segment basally, except above, and the second below, brownish-red; third segment only one-fourth longer than wide, obtuse apically; arista brownish, thickened on the basal half. Front not "bloated."

Thorax shining greenish-black, the disc of the mesonotum scarcely dulled by brownish pollen. Broad sides of the mesonotum reddish-yellow, the pale stripe broadly interrupted immediately in front of the posterior calli. Most of the mesopleura, and large spots on the sternopleura, pteropleura and metapleura, reddish-yellow. Mesonotum, scutellum and pteropleura black haired; pteura and the sides of the mesonotum immediately behind the humeri with yellow pile, a few black hairs on the posterior edge of the mesopleura. Scutellum yellowish, the disc transversely tinged with brown.

Anterior four legs yellowish-red, the tarsi wholly and the broad bases of the femora, black; posterior legs black, the broad bases of their tibiae reddish-yellow; hair black.

Wings strongly tinged with brown, the stigma darker. Squamae reddish-yellow, with brown border and brownish-yellow fringe. Halteres reddish.

Abdomen dull black, the lateral margins, fifth segment and apices of the segments shining. Sides of first segment broadly yellow. Second segment with a broad, arched median reddish yellow fascia which is narrowly separated from the lateral margins. The yellow fascia on the third segment is separated from the base by about half its width, widens laterally and is narrowly separated from the lateral margins; this fascia, which appears to be arched, has an average width equal to about two-fifths the length of the segment and approaches the base only a little more in the middle than at the sides. The pale fascia on the fourth segment is very similar to that on the third, but is conspicuously closer to the base of the segment, distinctly convex in front and a little more concave behind. Fifth segment with a large reddish triangle on either side. Pile black;

yellow only on the yellow spots on the second and most of the sides of the first, segment. Venter reddish.

*Female.* Front shining black, the lateral third of the sides reddish-yellow on the lower two-thirds, the median black stripe only a little widened anteriorly; pile black, that of face mostly yellowish. Lateral stripes of the mesonotum entire, the sides and pleura wholly yellow pilose. Yellow fascia on the second segment entire, narrowest in the middle. Fifth segment with the basal two-thirds reddish.

Described from ♂ 2 ♀, Mt. Kinabalu, Marei Parei, 5000 ft., April 18, 30 and May 1. H. M. Pendlebury. The type is the male. The allotype was taken on May 1.

***Syrphus fascipleura* sp. n.**

Related to *variscutatus* Curran but with much more extensively pale pleura, flat front, etc. Length, 12 mm.

*Male.* Face and cheeks yellow, the jowls blackish above and thinly grayish pollinose. Face at oral margin less prominent than at base of antennae; middle of face swollen, but with a low, nasiform tubercle, scarcely concave above. Frontal triangle reddish-yellow, more orange in front. Vertical triangle small, greenish-black, brownish pollinose and black pilose. Occiput yellow pollinose, clothed with shining yellow pile except above. Pile of the face yellow except above, of the frontal triangle and anterior half of the cheeks, black. Antennae brownish-red, the third segment broadly black above, one-fourth longer than wide, convex below, evenly rounded apically; arista blackish.

Mesonotum opaque, the median third greenish-gray, bordered laterally and posteriorly by black, the lateral margins broadly pale yellow. Upper two-thirds of pleura pale yellow, crossed by two black fasciae, the anterior one entire and occupying the anterior third of the mesopleura, the median one extending over the anterior part of the pteropleura but not extending on to the sternopleura. Pile reddish-yellow; black on the opaque black part of the mesonotum. Scutellum yellow with a large, subtriangular brown spot resting on the base and rounded apically; pile wholly black, including the ventral fringe.

Anterior four legs reddish-yellow, the tarsi black; posterior legs wholly black. Hair black except on the bases of the femora.

Wings cinereous hyaline; stigma yellowish-brown. Squamae yellow, with dark border and more or less black or brown fringe.

Abdomen black and reddish-yellow. First segment bordered laterally and anteriorly with yellow. Second segment with a pair of large, subtriangular pale spots which are rounded inwardly, oblique on the outer edge and pro-

duced broadly to the anterior corners, their posterior, gently convex edge at the posterior third of the segment. Pale fascia on third segment gently concave in front, separated from the base of the segment by more than half its median width, but almost reaching the base where it extends broadly over the lateral margins; fascia narrowest in the middle. Pale fascia on fourth segment similar to that on the third but a little narrower, situated closer to the base of the segment and extending more broadly over the lateral margins. Sides of fifth segment broadly reddish except on the narrow base. Pile black, on the sides of the first segment and the disc of the second in front of the black fascia, reddish-yellow. Sternum reddish-yellow, the second and following sternites very broadly black apically.

A single male, Mt. Kinabalu, Kenokok, 3300 ft., April 22, 1929 (H. M. Pendlebury).

#### B. Eyes pilose.

#### *Syrphus serarius* Wiedemann.

Ausser. Zweifl., ii, 128, 1830.

♀, Mt. Kinabalu, Kiau, 3,000 ft., April 3, 1929 (H. M. Pendlebury).

#### *Syrphus serarioides* de Meijere.

Tijd. v. Ent. lxvii, 218, 1924.

♀, Mt. Kinabalu, Kamborangah, 7,200 ft., April 18, 1929; ♀, Mt. Kinabalu, Marei Parei, 5,000 ft., April 30, 1929 (H. M. Pendlebury).

In this species the black facial vitta is wider than in *serarius* and reaches almost to the base of the antennae and the abdominal bands are reddish, instead of metallic gray.

#### *Syrphus koningsbergeri* de Meijere.

Tijd. v. Ent., lvii, 152, 1914.

5 ♂, ♀, Mt. Kinabalu, Pakka, 10,200 ft., March 25, 27, 1929 (H. M. Pendlebury).

In some of these specimens the face is almost all black and the scutellum sometimes has a metallic bluish tinge.

#### *Syrphus torvoides* de Meijere.

Tijd. v. Ent. lvii, 155, 1914.

♂, Mt. Kinabalu, Marei Parei, 5,000 ft., April 30, 1929 (H. M. Pendlebury).

The specimens mentioned by Brunetti (Fauna Brit. Ind., iii, 94), as differing from *confrator* Wiedemann, are probably representatives of this species.

#### *Syrphus hirsuteron* sp. n.

Somewhat like *bifasciatus* Fabricius but with hairy eyes and dull thorax. Length, 13 mm.

*Male.* Face and cheeks brownish-yellow, cinereous pollinose, the median vitta bare, broad, brownish-red, black below the tubercle. Face not nearly as prominent below as at the antennae, gently concave above, the tubercle moderately prominent, long and nasiform. Frontal triangle brownish-red pollinose, black pilose, bare and shining black in front. Vertex triangle brown pollinose, black haired. Hair of head yellowish; occipital cilia black. Occiput cinereous pollinose. Antennae deep black; third segment oval, rather evenly rounded apically, one-half longer than wide. Arista wholly black. Eyes clothed with short black hair which becomes obsolete below.

Thorax black; mesonotum dull, the sides and posterior border bronzed. Pleura yellowish gray pollinose. Pile tawny, black on the scutellum except the narrow base.

Femora black; apical half of anterior four and one-third of the posterior pair reddish. Tibiae reddish; apical half of the anterior pair and a post-median band on the middle pair, brownish-red; the posterior pair black on the apical three-fifths; anterior four tarsi reddish-brown, paler basally, the posterior pair black. Pile tawny, black on the posterior legs except the broad base of the femora.

Wings tinged with brown; stigma dark brown. Squamae reddish, with brown fringe. Halteres yellowish-red.

Abdomen subopaque black, with three narrow reddish fasciae, the first and third narrowly interrupted, all broadly separated from the lateral margin. The band on the second segment is very slightly arched, lies wholly before the middle and is only about one-seventh as wide as the length of the segment. Pale fasciae on the third and fourth segments separated from base of segment by less than their own width, slightly widening to the sides and therefore appearing a little more arched. The pale fasciae are thinly yellowish pollinose; the apices of the segments, lateral margins narrowly and the first segment wholly, shining. Pile rather long and abundant, tawny on the base of the abdomen, the lateral margins and on the pale fasciae, the second segment with black pile only on the posterior fourth or less. Venter black, or brown, grayish pollinose on basal half, the first three sternites yellow pilose; fourth sternite with metallic blue reflections and black pilose, the preceding sternite with scattered black hairs in the middle.

Type, ♂, Mt. Kinabalu, Pakka, 10,200 ft., March 25, 1929 (H. M. Pendlebury).

#### Genus *Asarkina* Macquart.

##### *Asarkina aegrota* Fabricius.

♂, 2 ♀, Kudat, Sept. 12, 12, 16, 1927 (Kloss and Pendlebury); ♂, Mt. Kinabalu, Kiau, 3000 ft., April 5, 1929; ♂, 2 ♀, near Kinabalu, Kabayau, 600 ft., May 9, 12, 1929; ♂,

Mt. Kinabalu, Kenokok, 3300 ft., April 25, 1929; ♀, Mt. Kinabau, Marei, Parei, 5,000 ft., May 1, 1929, (Pendlebury).

***Asarkina consequens* Walker.**

♂, ♀, near Kinabalu, Kabayau, 600 ft., May 8, (Pendlebury); ♂ ♀, Samawang, near Sandakan, July 13, August 6, 1927; 3 ♂, Bettotan, near Sandakan, July 26, August 6, 14, 1927, (Kloss and Pendlebury).

***Asarkina marokaensis* de Meijere.**

*Syrphus marokaensis* de Meijere, Tijds. v. Ent., li, 308, 1908.

2 ♂, 3 ♀, Mt. Kinabalu, Kenokok, 3300 ft., April 22-24, 1929; ♂, Mt. Kinabalu, Lobang, 4000 ft., April 5, 1929; ♂, Mt. Kinabalu, Marei Parei, 5000 ft., April 30, 1929 (Pendlebury).

***Asarkina biroi* Bezzi.**

Ann. Mus. Nat. Hung., vi, 498, 1908.

2 ♂, ♀, near Kinabalu, Kabayau, 600 ft., May 10, 13, 1929 (Pendlebury).

Genus *Sphærophoria* St. Fargeau et Serville.

**Table of Species.**

- |  |   |
|--|---|
| 1. Posterior tibiae wholly black,<br>or black with a broad yellowish median band -             | 2.                                      |
| Posterior tibiae yellow on basal half or yellowish with broad brown or black median band - - - | 5.                                      |
| 2. Posterior tibiae wholly black -   | 3.                                      |
| Posterior tibiae with broad yellowish median band -  | 4.                                      |
| 3. Antennae black, the third segment reddish below basally - - -                               | <i>obscuricornis</i> de Meijere.        |
| Antennae reddish-yellow, the third segment blackish above - - -                                | <i>nigrotibialis</i> Curran.            |
| 4. The yellow forms a continuous band from the sternopleura to the metapleura -                | <i>javana</i> Wiedemann.                |
| The yellow band is broadly interrupted below the pteropleura - - -                             | <i>medanensis</i> de Meijere            |
| 5. Third antennal segment sub cylindrical, rather pointed apically - - -                       | <i>Ischiodon scutellaris</i> Fabricius. |



Third antennal segment laterally compressed, obtuse apically. (This group has not been represented in the collections so far received).

**Sphærophoria javana** Wiedemann.

*Syrphus javanus* Wiedemann, Anal. Ent. 34, 1824.

♀, Mangalum Island, July 9–15, 1928 (C. Boden Kloss).

**Sphærophoria medanensis** de Meijere.

*S. javana medanensis* de Meijere, Tijds. v. Ent., lvii, 166, 1914.

♀, Mt. Kinabalu, Marei Parei, 5000 ft., April 30, 1929 (H. M. Pendlebury).

This species, if I have correctly identified it, is larger and more robust than *javana* has a much broader abdomen, sides of face rather narrowly yellow and the pteropleura wholly blackish.

**Sphærophoria nigrotibialis** Curran.

Journ. F.M.S. Mus., xiv, 241, 1928.

♂, near Kinabalu, Kabayau, 600 ft., May 12, 1929 (H. M. Pendlebury).

Only the female has been described. In the male the front is dull yellowish with a black spot anteriorly. The genitalia are small and shining black.

#### Genus *Baccha* Fabricius.

One of the five species secured in Borneo represents an undescribed form. The key given in the paper on Malay *Syrphidae* includes the Bornean species.

#### Sub-genus *Baccha*.

Humeri wholly without hair.

***Baccha maculata*** Walker.

Ins. Saunders. Dipt., 223, 1852.

2 ♂, Mt. Kinabalu, Lumu Lumu, 5500 ft., April 15, 1929 (H. M. Pendlebury).

***Baccha gigas*** sp. n.

Scutellum wholly yellowish; wings pale brownish, brown in front; face wholly yellow. Length, 15 mm.

*Female*. Cheeks wholly, and the face, yellowish, the latter, with the exception of the tubercle, yellowish white pollinose and with pale yellow pile. Front black, the anterior border yellow; covered with brownish-yellow pollen which leaves a triangle above the antennae and the upper-fourth bare; pile yellowish, black on the upper fourth and immediately above the antennae. Occiput pale yellowish

pollinose and pilose; occipital cilia black, but shorter than the yellowish hair amidst which they are placed. Face gently receding, with a large tubercle lying mostly below the middle. Antennae brownish-red, paler below; arista brown except basally.

Thorax greenish-black, the mesonotum thinly brown pollinose. A broad lateral stripe in front of the suture, the mesopleura mostly, a large contiguous spot on the sternopleura and a large spot on the metapleura, yellowish in ground color and thickly yellow pollinose. Hair very short and yellowish, not conspicuous. Scutellum reddish-yellow, thinly yellow pollinose and with only a few scattered, short hairs; without ventral fringe.

Legs reddish-yellow; median third of the posterior femora, apical fourth of their tibiae and the basal three-fourths of the first segment of the posterior tarsi, black. Hair short, yellow; somewhat longer on the posterior surface of the anterior four femora.

Wings strongly tinged with brown; narrowly brown along the costa, the costal cell more brownish-yellow, the brown color reaching to beyond the tip of the third vein. Alula of moderate width, narrowing from apex to basal fourth. Squamae and halteres pale orange, the former with inconspicuous fringe.

Abdomen black, with yellowish-red or reddish markings. First segment reddish; second segment blackish, with a pair of very large reddish triangles on the base which are continued along the lateral margins to connect with a pair of broadly separated, inwardly convex, elongate spots situated at the apical fourth. Third segment with about the median third reddish, the base brown, the apex blackish. Fourth segment blackish, the second fourth reddish, the pale fascia very broadly separated from the lateral margins and narrowly interrupted in the middle. Fifth and sixth segments brown, the following ones reddish. The reddish fasciae on the third and fourth segments are brownish gray pollinose. Pile black, short, yellow on the first segment and sides of the second. Venter brownish and reddish; black haired.

Type, ♀, Mt. Kinabalu, Marei Parei, 5,000 ft., April 30, 1929, (H. M. Pendlebury). A second specimen, taken the following day, lacks its head.

***Baccha pedicellata* Doleschall.**

Nat. Tijd. v. Ned. Ind., x, 411, 1856.

♀, Samawang, near Sandakan, jungle, July 9, 1927 (Kloss and Pendlebury).

Shiraki considers this a synonym of *amphithoe* Walker, but I cannot agree. I have no specimen agreeing with the

description of *amphithoe*, but if Brunetti has correctly identified Walker's species the two are abundantly distinct.

### Sub-genus *Allobaccha*.

Humeri with hair posteriorly.

#### *Baccha fallax* Austen.

Proc. Zool. Soc. Lond., p. 142, 1893.

♂, Samawang, near Sandakan, jungle, July 14, 1927 (Kloss and Pendlebury).

This specimen agrees in abdominal markings with the original description and figure.

#### *Baccha porphyra* Curran.

Journ. F.M.S. Mus., xiv, 254, 1928.

♀, Mt. Kinabalu, Lumu Lumu, 5500 ft., April 17, 1929 (H. M. Pendlebury).

This specimen has the abdomen largely reddish, even more so than in the female of *pulchrifrons* but it seems to belong here.

#### *Paragus serratus* Fabricius.

*Mulio serratus* Fabricius, Syst. Antl., 186, 1805.

Two males, one female, Kudat, Sept. 1, 14, 18, 1927; ♂, Samawang, near Sandakan, July 8, 1927, (Kloss and Pendlebury); ♂, near Kinabalu, Tenompok Pass, 4700 ft., March 18, 1929 (Pendlebury).

### Genus *Melanostoma* Schiner.

I have attempted to prepare a key for the separation of the known species of *Melanostoma* from India and Malaya. However, I have no representatives of two of the species described by de Meijere and the resultant table may prove inadequate in the last two or three couplets.

#### Table of Species.

1. Face with only a trace of a  
tubercle - - - - - *univittatum*  
Wiedemann.  
Face with a conspicuous  
tubercle - - - - - 2.
2. Abdomen without distinct red-  
dish spots - - - - - *ambiguum* Fallen.  
Abdomen with reddish mark-  
ings - - - - - 3.
3. Second to fourth abdominal  
segments each with broad,  
entire reddish fasciae - *quadrifasciatum*  
Curran.  
Abdominal bands interrupted  
in the middle - - - - - 4.

4. Anterior four femora black on basal half or more - - - 5.  
Anterior four femora reddish on basal half or more - 6.
5. Anterior femora black except the narrow apex; facial tubercle very prominent - *algens* sp. n.  
Anterior four femora black on about the basal half, reddish apically; facial tubercle not unusually prominent - - - 9.
6. Second abdominal segment wholly black - - - 7.  
Second abdominal segment with a pair of large, oval or circular pale spots - - - (♀) *orientale* Wiedemann.
7. Pale abdominal spots in female not reaching the lateral margins - - - - (♀) *gedehensis* de Meijere.  
The pale abdominal spots extend over the lateral margins - - - - 8.
8. Anterior femora and tibiae with broad brownish bands - - - - (♂) *gedehanus* de Meijere.  
Anterior femora and tibiae wholly pale reddish yellow - - - - *normalis* sp. n.
9. Second abdominal segment with a pair of large yellowish spots - - - - (♂) *orientale* Wiedemann.  
Second abdominal segment without pale spots - - - *talamaui* de Meijere.

**Melanostoma univittatum** Wiedemann.

*Syrphus univittatus* Wiedemann, Anal. Ent., 36, 1824.

3 ♀, Bettotan, near Sandakan, Aug. 2, 24, 26, 1927 (Kloss and Pendlebury); ♀, near Kinabalu, Kabayau, 600 ft., 1929 (Pendlebury).

**Melanostoma algens** sp. n.

Black, the abdomen of the male with two, of the female with three pairs of orange spots; legs practically all black; wings tinged with dark brown. Length, 7 to 7.5 mm.

*Male.* Head greenish-black, face, cheeks and occiput cinereous pollinose, the face broadly brown pollinose in the middle or the occiput and cheeks brownish yellow pollinose and the face wholly brownish; tubercle, anterior oral margin and a triangle separating the face and cheeks, shining black. Facial tubercle lying mostly below the middle of the face, very prominent, the oral margin produced but very much less prominent than the tubercle. Frontal triangle thinly brownish-gray to yellowish-brown pollinose, very narrowly bare in front; rather large and gently convex. Vertex triangle a little longer than wide, with scarcely a trace of pollen. Pile black, rather coarse, on the lower third of the occiput and the posterior half of the cheeks, yellowish or pale cinereous. Antennae entirely deep black; third segment short, not one-half longer than wide, convex below and apically; arista stout on almost the basal half and quite bare.

Thorax dark greenish-black, the mesonotum very thinly brownish-gray pollinose, the pleura with more cinereous pollen. Pile black, on the pleura brownish-yellow. Scutellum shining greenish-black, black haired.

Legs black; tips of femora and narrow bases of the tibiae sometimes reddish. Hair black.

Wings strongly tinged with blackish-brown. Squamae brownish, with brownish-yellow fringe. Halteres yellow.

Abdomen opaque black, with four rectangular dull yellow spots. First segment shining greenish-black; second with a very large rectangle on either side basally, reaching to beyond the middle of the segment subopaque, the lateral margins shining greenish-black or bronze. The yellow spots on the third segment form a basal fascia which is broadly interrupted but extends over the side margins in almost its full width and occupies almost or quite one-half of the segment. The pale fascia on the fourth segment is very similar to that on the preceding one, but the spots are usually slightly widened toward either side although they may be more or less distinctly separated from the lateral margin on their posterior half; this fascia occupies the basal half of the segment or slightly more. Fifth segment and genitalia shining greenish-black. Pile black, yellowish on the broad base of the abdomen and on the yellow spots. Venter marked much the same as the dorsum, black and reddish-yellow; thinly yellowish pollinose and with pale pile on the basal segments.

*Female.* Front very shining, aeneous, conspicuously yellowish cinereous pollinose except across the upper third, the vertex densely pollinose. Pile black. Thorax with shorter black pile than in the male, broadly pale pilose laterally and sometimes with reddish brown or even yellowish pile intermixed with the black, especially in front

of the suture. Wings cinereous rather than brown, the stigma dark brown. Second abdominal segment with the broad sides and a very large anterior rectangular spot on either side, extending from the base to beyond the middle of the segment, shining black or metallic greenish-black, and bearing near its inner posterior corner a small, roundish or oval, reddish spot. Base of the third segment bearing a very broadly interrupted reddish fascia, which extends broadly over the lateral margins. The spots thus formed are much wider on their inner half or more which is convex posteriorly, very little narrowed to the sides; the width of the spots varies, but at their widest point they do not occupy more than the basal half of the segment; fourth segment similarly marked. Fifth segment with the basal third, broadly interrupted in the middle, reddish. The abdomen is rather shining, especially laterally and apically.

Described from 7 ♂, 4 ♀, Mt. Kinabalu, Pakka, 10,000 ft., March 24, 25, 1929 (H. M. Pendlebury). The holotype ♂ and allotype were taken on March 24.

***Melanostoma normalis* sp. n.**

Related to *orientalis* Wiedemann but the second abdominal segment is without pale spots and the anterior four legs are wholly reddish-yellow. Length, 7.5 to 8.5 mm.

Male. Head greenish-black, very shining; face, cheeks, and posterior orbits whitish pollinose, the face thinly so, the tubercle, anterior oral margin and the cheeks in front, bare; facial and frontal orbits narrowly more thickly whitish or yellowish pollinose. Frontal triangle large, gently convex, with about two rows of black hairs toward the orbits; facial pile pale, inconspicuous, the posterior orbits with whitish pile; their upper fourth and the vertical triangle black haired. Vertical triangle rather small, thinly cinereous pollinose. Face gently receding below, the oral margin slightly produced, the tubercle not prominent (about as in *melinum* L. ), roundish. Antennae reddish-yellow, the third segment broadly brown above; arista brown, luteous basally, thickened on basal third; not pubescent.

Thorax very shining metallic greenish-black, the pleura thinly brownish-yellow or cinereous pollinose. Pile rather dull brassy yellow.

Anterior four legs reddish-yellow, their coxae greenish black, the median segments of the front tarsi not or only lightly browned above. Posterior femora on subapical third, the apical two-thirds of their tibiae and the apical three segments of their tarsi, blackish, the tibiae broadly reddish apically.

Wings cinereous hyaline. Squamae pale yellowish, with brownish-yellow border and fringe. Halteres reddish-yellow.

Abdomen opaque black with two broad, interrupted reddish-yellow bands, the first segment, lateral margins and broad apex, shining. The yellow band on the third segment is narrowly interrupted in the middle, occupies less than the basal half of the segment at the sides, and usually more than half toward the middle, the posterior border gently convex except toward the sides. The band on the fourth segment is narrower than the preceding one and is usually less widened toward the inner ends of the spots which do not extend back quite to the middle of the segment. Pile pale yellowish; black on the black parts of the third, following segments and genitalia. The color of the venter and its pile agrees well with the dorsal coloration.

*Female.* Front shining greenish-black, below the middle with a rather narrow arch of cinereous white pollen, the orbits below narrowly covered with similar pollen. Hair black, on the front, on the occiput wholly yellowish. Hair of thorax somewhat shorter. Abdomen shining, with three pale orange bands all of which are interrupted in the middle. The yellow spots on the third segment are narrow at the sides, where they occupy less than the basal fourth of the segment, in the middle occupying about half the length of the segment and convex behind; the spots on the fourth segment are quite as large as those on the third, but are more gradually narrowed toward the sides. The band on the fifth segment is less widely interrupted than the preceding ones and occupies about the basal fifth.

There is a little variation in the size and shape of the abdominal spots in both sexes and especially in the female where the pale spots may be considerably reduced. Two specimens have the face much more shining than the others.

Described from 44 ♂, 21 ♀, Mt. Kinabalu, Marei Parei, April 28 to May 2, 1929; 2 ♂ ♀, Tenompok Pass, 4,700 ft., March 18, 1929 (H. M. Pendlebury). The holotype, ♂, and allotype were taken on April 29.

#### CHEILOSINÆ.

#### *Spheginobaccha macropoda* Bigot.

*Sphegina macropoda* Bigot, Ann. Soc. Ent. Fr., (6) iii, 331, 1883.

3 ♂, 3 ♀, Bettotan, near Sandakan, August 5 to 24, 1927 (Kloss and Pendlebury).

#### Genus *Callicera* Panzer.

The key which follows separates the species occurring in the Indo-Malayan region.

#### Table of Species.

1. Face with a very broad shining  
black vitta       -       -       2.

- Facial vitta very narrow, the pollen and pile extensive - *sackeni* Verrall.
2. Third abdominal segment brown or black pilose except on the sides; anterior four femora with only the apical sixth reddish - 3.
- Third abdominal segment yellow pilose; apical half of anterior four femora orange-red - - - *doleschalli* Verrall.
3. Anterior third of mesonotum tawny or reddish-yellow pilose; abdomen black-haired, the sides and fourth segment rather tawny or reddish-yellow style long - - - *pendleburyi* Curran.
- Mesonotum brown pilose in front; abdomen black and brown pilose dorsally; style short - - - *sumatrensis* de Meijere.

***Callicera pendleburyi* Curran.**

Journ. F.M.S. Mus., xiv, 273, 1928.

♂, Mt. Kinabalu, Marei Parei, 5000 ft., April 28, 1929 (H. M. Pendlebury).

**Genus *Rhingia* Scopoli.**

The key which follows will serve to distinguish the species occurring in Malaya.

**Table of Species.**

1. Abdomen with the basal three segments yellow, the third blackish posteriorly (Sumatra) - - - *basalis* de Meijere.
- Abdomen either with three pairs of yellowish spots or black or brown on the apical three segments - 2.
2. Abdomen with the first segment yellowish, the following three each with a pair of transverse reddish spots (F.M.S.) - - - *chaetosa* Curran.
- Abdomen black or brown with paler base - - - 3.



3. Abdomen dark brown, lighter basally, the hind margins of the second and third segments blackish (Sumatra) - - - *robinsoni* Edwards.  
 Abdomen shining bluish-black, the base brownish-yellow - 4.
4. Wings yellowish on basal half; squamal fringe yellow - *varipennis* sp. n.  
 Wings almost uniformly tinged with yellowish-brown; squamal fringe brown - *uniformis* sp. n.

***Rhingia varipennis* sp. n.**

Shining black, the wings yellow on basal half or more. Length, including snout, 8 to 10 mm.

*Male.* Face and anterior half of the cheeks shining brownish-red, the immediate orbits gray pollinose; upper surface of snout with a broad black vitta reaching almost to the antennae. Front shining black, the orbits narrowly gray pollinose. Cheeks shining brown. Occiput gray pollinose and yellow pilose, the cheeks with paler pile. Vertical triangle small, black, thinly brown pollinose and black pilose, the occipital cilia black. Antennae reddish, third segment narrowly brown above. Arista reddish on basal half, black apically, very short plumose. Rostrum three-fourths as long as length of head at lowest third.

Thorax shining brownish-black, dulled by brown pollen which is most abundant on the anterior two-thirds of the mesonotum; pollen on the broad sides of the mesonotum anteriorly and on the anterior part of the pleura grayish brown. Pile short and only moderately abundant, mixed black and tawny, the black predominating. Scutellum shining black, with short black hair and several marginal bristles, the ventral fringe long and yellowish.

Femora black, the apices reddish; tibiae brown, the bases broadly reddish; tarsi brown. Pile black; pubescence brownish-red.

Wings yellowish on basal half or more, tinged with brown apically, the stigma pale brownish. Squamae yellow, with yellow border and fringe, the lower lobe with the border and fringe brownish near the inner end. Halteres yellowish.

Abdomen shining black or blue-black, the first segment brownish-yellow, the second often brown in the middle on the basal half or less. Pile rather obscure yellowish; black on the lateral margins. Genitalia shining black, black haired. Venter shining black, thinly brownish pollinose basally, black haired.

*Female.* Front blackish, wide, moderately dulled by very fine brownish pollen; hair sparse, black; very narrow orbits cinereous pollinose on lowest two-thirds. Pile of thorax practically all black, that on the abdomen black beyond the middle of the second segment. Squamæ and fringe wholly yellow.

Described from ♂ 8 ♀, Mt. Kinabalu, Lumu Lumu, 5000–5500 ft., April 7 to 16, 1929, 2 ♀, Mt. Kinabalu, Kenokok, 3300 ft., April 22, 25, 1929 and ♂ ♀, Mt. Kinabalu, Marei Parei, 5000 ft., April 4, 28, 1929 (H. M. Pendlebury). The type male and allotype are from Lumu Lumu, April 7 and 9 respectively.

***Rhingia uniformis* sp. n.**

Resembles *varipennis* but the wings are almost uniformly colored, the brownish-gray squamæ are bordered with brown and bear a brown fringe, etc. Length, including snout, 7 to 10.5 mm.

*Male.* Face and anterior half of the cheeks, brownish-red, the upper part of the face and the orbits narrowly, grayish pollinose. A broad black vitta extends along the upper surface of the snout and reaches obscurely to the antennæ, the apex of the snout usually broadly blackish. Cheeks reddish-brown posteriorly. Front shining blackish, very broadly grayish-yellow pollinose laterally and above Occiput gray pollinose, with cinereous yellow pile except above. Vertical triangle brown pollinose and black haired, the occipital cilia black. Antennæ reddish, the third segment black above; arista black, very short plumose.

Thorax bluish-black, moderately brown pollinose, wholly black pilose. Scutellum shining, with short black hair above and several fine marginal bristles. Ventral fringe long and yellowish.

Femora black, brownish pollinose, their apices reddish. Tibiæ and tarsi brown, the former broadly reddish basally. Hair black.

Wings lightly tinged with brown, sometimes a little luteous along the costa on the basal half; stigma pale brown. Halteres reddish, with brown knob.

Abdomen shining blue-black, the first segment usually brownish-yellow, sometimes yellow-brown, the second sometimes brownish basally in the middle. Pile sparse, black, yellowish on the first segment and basal half of the second. Genitalia shining black. Venter black, brown pollinose basally, black haired.

*Female.* Front wide, slightly narrowing above, thinly brown pollinose except below, the sides not cinereous pollinose; pile wholly black.

Described from ♂ 22 ♀, Mt. Kinabalu, Kamborangah, 7,200 ft., March 27 to April 5, 1929 and ♀, Mt. Kinabalu, Pakka, 10,200 ft., March 21, 1929 (H. M. Pendlebury). The type male and allotype were taken on April 4.

## XYLOTINÆ.

Genus *Xylota* Meigen.

1. Tibiæ wholly testaceous;  
femora chalybeous - - - *conformis* Walker.  
At least the posterior tibiæ  
broadly black or brown - 2.
2. All the femora red except the  
broad apex of the posterior  
pair - - - - *brunettii* Curran.  
At least one pair of femora  
more broadly black or  
brown - - - - 3.
3. Anterior four femora wholly  
reddish - - - - 4.  
Anterior femora partly or  
wholly blackish or metal-  
lic - - - - 5.
4. First abdominal segment  
mostly yellowish - - *annulata* Brunetti.  
First abdominal segment  
brown - - - - *annulipes* de Meijere.
5. Basal half or more of the  
anterior four femora  
reddish - - - - *doris* Curran.  
Anterior femora blackish with  
the apices reddish - - 6.
6. Middle tibiæ wholly yellow - *pendleburyi* Curran.  
Middle tibiæ largely brown in  
ground color - - - 7.
7. Thorax and abdomen metallic  
blue - - - - *morna* sp. n.  
Thorax and abdomen greenish  
black or blackish aeneous - 8.
8. Pile on apical half of posterior  
surface of middle tibiæ  
much longer than the  
thickness of the tibia - *spinipes* Curran.  
Pile of middle tibiæ short,  
appressed or sub-ap-  
pressed - - - - *nigroaenescens*  
Rondani.

***Xylota morna* sp. n.**

A large, metallic dark blue species with cinereous pilose vittae on the mesonotum and opaque black abdominal markings. Length, 13 to 15 mm.

*Male.* Face and cheeks brown in ground color, but densely covered with cinereous white pollen; face strongly receding on upper three-fifths and moderately produced below. Frontal protuberance strong, with a rectangular metallic blue spot dorsally, the frontal triangle blackish blue and densely pollinose. Vertical triangle long, bluish, yellow pilose, the ocelli situated far forward. Occiput white pollinose and pilose. Antennae black; third segment with thin cinereous pollen, sub-oval, slightly more than one-half longer than wide; arista brown, much longer than the width of the front.

Thorax and scutellum metallic dark blue, short, black pilose, the mesonotum with a pair of broadly separated cinereous pilose vittae which have a yellowish tint in some lights; notopleura pale pilose; a broad band of cinereous white pollen and pile extends over the mesopleura and sternopleura. Scutellum large, its pile mostly cinereous white, the disc with black hairs intermixed.

Legs metallic blue; tips of the femora, basal third of the tibiae (less of the hind pair) and the basal three segments of the anterior four tarsi, yellow. Femora with erect or suberect yellowish-white hair, the posterior pair black or brown haired on apical half of lower surface and on the broad apex except the dorsal line. The tibiae bear closely appressed whitish hair which gives them a silvery white sheen, the hair on the ventral surface more yellow. Basal segments of the anterior four tarsi white haired, the apical segments and the entire dorsal surface of the posterior pair, black haired.

Wings cinereous hyaline, tinged with dark brown on the apical half. Squamae white, with brownish border and fringe. Halteres reddish-yellow.

Abdomen metallic dark blue. An incomplete, sub-triangular basal fascia on the second segment, a narrow median vitta, and a transverse, sub-apical fascia, opaque black. Apical half of third segment opaque black, the sides cut off obliquely. All the black markings are broadly separated from the lateral margins and bear short, black hair, the hair elsewhere erect, short, and white. Venter reddish-brown, white pilose; fourth sternite metallic blackish-blue, thinly brown pollinose and black pilose. Genitalia with cinereous white pile.

Three ♂, Bettotan, near Sandakan, August 10, 20, 27, 1927 (Kloss and Pendlebury). The type was taken on August 10.

***Xylota nigroaenescens* Rondani.**

Ann. Mus. Civ. Genova, vii, 422, 1875.

*Xylota striga* de Meijere, Tijd. v. Ent., lvii, 142, 1914.

*Xylota petulans* Curran, Journ. F.M.S. Mus., xiv, 282, 1928.

2 ♂ ♀, Bettotan, near Sandakan, July 10, August 20, 21, 1927 (Kloss and Pendlebury).

These specimens agree well with the poor description given by Rondani, and I believe that they are the same as *striga*, described from Java. They do not differ from paratypes of *petulans* and I feel that the above suggested synonymy will prove to be correct when the types have been compared.

***Xylota pendleburyi* Curran.**

Journ. F.M.S. Mus., 279, 1928.

4 ♀, Bettotan, near Sandakan, August 9, 21, 22, 1927 (Kloss and Pendlebury).

In the female there is no spur on the posterior trochanters and the wings are cinereous hyaline, somewhat darker on the apical half. The four brassy yellow vittae on the mesonotum are very distinct. In the key to the species of *Xylota* given in the above mentioned reference, there is little sense to the second half of the diagnosis in the complete containing this species owing to the omission of several words. The description of the hind femora given with the complete diagnosis must be referred to in order to correct this error.

**Genus *Syritta* St. Fargeau and Serville.*****Syritta orientalis* Macquart.**

Dipt. Exot. ii, (2), 76, 1842.

♂, Kudat, Sept. 12, 1927 (Kloss and Pendlebury).

**SERICOMYINÆ.****Genus *Pseudovolucella* Shiraki.**

Mem. Fac. Sci. Agr. Taihoku Imp. Univ., i, 39, 1930.

The Malayan species which I placed in the genus *Pararctophila* belongs to this genus. The following key separates the known species.

**Table of Species.**

- |  |       |    |
|--|-------|----|
| 1. At least the third abdominal segment with a reddish fascia which may be interrupted | - - - | 2. |
| Abdomen without distinct reddish fasciae   | - - - | 4. |
| 2. Second abdominal segment with one or two reddish or reddish-yellow fasciae          | -     | 3. |

- First and second abdominal segments yellowish (Japan) - - - - *decipiens* Hervé-Bazin.
3. Second abdominal segment with two fasciae (Formosa) - - - - *mimica* Shiraki.
- Second segment with one fascia (Borneo) - - - *fasciata* sp. n.
4. Front yellowish pilose; abdomen brownish-orange (F.M.S.) - - - - *malayana* Curran.
- Front black pilose; abdomen brownish (Java) - - - *apiformis* de Meijere.

***Pseudovolucella fasciata* sp. n.**

Blackish, the face, legs and abdomen partly reddish. Length, 11 to 15 mm.

*Male.* Face yellowish, a broad, geminate median vitta shining brown, a stripe separating the face and cheeks brownish-yellow. Head with yellowish pollen, the facial stripe bare; frontal triangle with more brownish tinged pollen, its anterior border shining black. Vertical triangle thinly brownish pollinose. Occipital cilia and pile of the frontal and vertical triangles black; pile of face and occiput pale yellow. Antennae black; third segment brown; arista luteous, with black apex and rays.

Thorax thinly brownish-gray pollinose, with dull reddish pile, the pleural pile paler. Humeri. posterior calli and scutellum reddish-brown to reddish. Mesonotum often with brown hair intermixed with the pale.

Anterior four legs reddish, the apical two tarsal segments brown; femora somewhat darkened apically and dorsally; pile pale yellowish, black on the tips of the femora and the apical segments of the tarsi. Posterior legs black, the femora red on the basal third to half, yellow pilose; apical half, except above and below (the apical fifth wholly) black haired; tibiae and tarsi black haired except ventrally.

Wings tinged with luteous on the anterior basal half, with a small, brown spot over the crossveins; apical part tinged with brown, otherwise cinereous hyaline.

Abdomen sub-shining, brownish-black; first segment and very narrow base of the second, dull reddish-yellow; a slightly arched, entire median fascia on the second to fourth segments shining orange or yellowish-red. The width of the bands is equal to less than one-third the length of the third abdominal segment. Pile short and black; on the broad base, immediate sides, and genitalia, longer and rather tawny. Genitalia reddish.

*Female.* Front opaque black on upper half, with a broad arch of gray pollen below the middle, the lower fourth brown pollinose. Pile of the front and upper part of the face black, the sides of the face wholly pale pilose. Front tibiae sometimes brownish in front and apically, the tarsi darker. Posterior femora much more slender and without a distinct tubercle apically. Fifth abdominal segment sometimes mostly reddish, or with only a pair of arched spots, the inner ends resting on the base of the segments medianly.

Described from 19 ♂, 2 ♀, Mt. Kinabalu, Kamborangah, 7000 ft., March 25, April 2, 4, 1929; 2 ♂, ♀, Mt. Kinabalu, Lumu Lumu, 5500 ft., April 11, 12, 16, 1929 and 3 ♂, 3 ♀, Mt. Kinabalu, Marei Parei, 5000 ft., April 1, May 1, 2, 1929 (H. M. Pendlebury). The holotype, ♂ and allotype, ♀, are from Lumu Lumu.

#### ERISTALINÆ.

##### Genus *Klossia* gen. n.

Related to *Helophilus* Meigen but with only indistinct stripes on the mesonotum and with a large tubercle on the lower half of the face. Head wholly black.

Face concave above, the tubercle as prominent as the prominent antennal protuberance, the oral margin not more prominent than the upper part of the face at the middle of the concavity. (Eyes of male undoubtedly contiguous). Eyes bare. Antennae short, the third segment oval, its lower edge almost straight; arista bare, long and slender. Mesonotum with a pair of weak, sub-median grayish vittae. Wings with the marginal cell broadly open. Legs simple, the posterior femora a little swollen, their tibiae enlarged, largest in the middle, scarcely arcuate. Abdomen short, as in *Eristalis niger*. Genotype, *K. dimidiata*, sp. n.

##### *Klossia dimidiata* sp. n.

Blackish, the wings blackish-brown on more than the basal half, the apex cinereous hyaline. Length, 9.5 mm.

*Female.* Face shining black, a median triangle below the antennae and the narrow orbits cinereous, in some lights silvery white; pile yellow, of moderate length. Front bluish-black, opaque black on upper three-fifths the lower border produced into three triangles, the ones resting on the orbits longer and in some views mostly silvery white; vertex shining; pile black, erect. Occiput silvery white, with very short yellowish pile, the upper fourth bare, and with short black pile. Antennae reddish-brown.

Mesonotum opaque black, the sides broadly behind the middle, an orbicular spot above the notopleura, the humeri and a narrow incomplete vitta contiguous to each of the entire, broadly separated brownish-gray vittae, shining

black, the lateral margins in front of the suture broadly brownish-gray pollinose; pile black, tawny on the notopleura. Pleura shining greenish-black, the mesopleura partly and an area below the squamae brownish-red; pile tawny, black on the pteropleura. Scutellum shining black, thickly black pilose, the base with a few scattered tawny hairs.

Legs black or blackish-brown, with rather abundant short black hair, that on the posterior surfaces of the anterior four femora longer. Anterior four tibiae with the basal fourth yellow and bearing white hair, the posterior tibiae with less than the basal fifth reddish and clothed with white hair above.

Wings broadly tinged with yellow beyond the brown field; third vein deeply looped into apical cell. Squamae and their fringe brown. Halteres reddish-yellow.

Abdomen brown, with opaque black and obscure brownish-red markings. First segment wholly opaque, brownish-red, the posterior border brown. Second opaque blackish-brown, with a large, obscure subtriangular brownish-red spot on either side, lying mostly on the anterior half of the segment, broadly separated from the anterior margin and connected with the lateral margin by a shining black stripe, which does not reach the posterior border of the segment. Third segment with slightly larger dull, brownish-red spots which are less widely separated from the anterior border, the shining lateral stripe narrower, the apex of the segment shining brownish-red. On the fourth segment the dull brownish-red spots are broadly separated from the triangularly produced shining ferruginous posterior border by a broad opaque blackish band. Fifth segment wholly shining brownish-red. Pile yellowish; black on the broad posterior border and middle of the second segment and on the third segment except for a few pale hairs on the reddish triangles.

Described from a single ♀, Bettotan, near Sandakan, July 29, 1927 (Kloss and Pendlebury).

#### Genus *Dissoptera* Edwards.

##### *Dissoptera heterothrix* de Meijere.

*Eristalis heterothrix* de Meijere, Tijds. v. Ent. li, 273, 1908.

♂, 8 ♀, Mangalum Island, N.W. Borneo, July 9-15, 1928 (C. Boden Kloss).

Shiraki considers *pollinosa* Edwards to be the same as *heterothrix* but I am not certain that this is the case. My specimens do not agree well with Edwards description and it seems likely that the two are distinct.



Genus *Korinchia* Edwards.

The following key separates the known species belonging to this genus.

## Table of Species.

- |  |    |                            |
|--|----|----------------------------|
| 1. Scutellum black in ground color, the margin sometimes broadly yellow or brown - - - -             | 2. |                            |
| Scutellum wholly reddish in ground color - - -   |    | <i>rufa</i> Hervé-Bazin.   |
| 2. Scutellum clothed with erect hair, which is rarely yellow on the disc - -                         | 3. |                            |
| Scutellum with dense appressed golden hair, the posterior border with several long brown hairs - - - |    | <i>aurata</i> Hervé-Bazin. |
| 3. Front tarsi wholly or mostly black - - - -  | 4. |                            |
| Front tarsi wholly reddish yellow - - - -  |    | <i>apicalis</i> Shiraki.   |
| 4. Second abdominal segment with a large reddish or yellow spot on either side                       |    | <i>formosana</i> Shiraki.  |
| Second segment with at most small reddish spot on anterior corners - -                               | 5. |                            |
| 5. Posterior calli yellow haired on outer side - - - -   | 6. |                            |
| Posterior calli wholly black haired - - - -  |    | <i>monticola</i> Edwards.  |
| 6. Scutellar pile largely blackish -   | 7. |                            |
| Scutellar pile mostly yellowish -  | 8. |                            |
| 7. Fourth abdominal segment with large yellowish-gray patch on either side - -                       |    | <i>klossi</i> Edwards.     |
| Fourth segment without grayish patch - - - -   |    | <i>robinsoni</i> Edwards.  |
| 8. Abdomen rusty reddish, wings with irregular brownish median fascia and brownish apical fourth - - |    | <i>sinensis</i> Curran.    |
| Abdomen black; wings without median fascia, the apical third brownish - - -                          |    | <i>pendleburyi</i> sp. n.  |

**Korinchia pendleburyi** sp. n.

Related to *sinensis* Curran but with blackish abdomen, without brownish spot immediately above the middle of the oral margin, etc. Length, 12.5 to 16 mm.

**Male.** Face and cheeks brownish-yellow, yellowish pollinose, a broad stripe on the anterior part of the cheeks and a median vitta on the lowest two-thirds of the face bare; face in profile strongly receding above, and very gently concave above the weak tubercle. Frontal triangle brown, broadly yellowish pollinose above and laterally. Vertical triangle black haired; yellow pollinose in front. Occiput grayish-white pollinose, becoming brownish above, the pile pale yellow, the occipital cilia short and black. Face and front without pile. Antennae rusty reddish; third segment little longer than wide.

Mesonotum slightly shining black; in front with a rather narrow yellowish pollinose fascia which is broadly darker in the middle; sutural depressions narrowly yellow pollinose, and in front of the scutellum a broader, incomplete band. In some views the broad middle of the mesonotum in front of the suture is brownish yellow pollinose. Pile yellow in front of the suture, on the narrow posterior border, and on the lateral margin except immediately behind the suture; in front of the suture with scattered black hairs. Pleura brown or brownish-red, the mesopleura pale in ground color on the posterior third; propleura and a broad band extending over the mesopleura and sternopleura, bright yellow pollinose. Scutellum black, the free border yellow; pile yellow with a few scattered blackish hairs on the disc.

Legs rusty reddish, the tibiae paler; anterior tarsi black. Hair reddish-yellow, paler on the tibiae; coarse, short and black beneath the femora, dense beneath the posterior pair. Apical segment of the posterior four tarsi and the anterior pair wholly, black haired.

Wings tinged with luteous, the apical third brownish. Squamae brownish. Halteres rusty reddish.

Abdomen black or brown, opaque. Broad posterior border and sides of the first segment bright yellow pollinose. Second segment sometimes brownish-red, shining laterally; anterior corners with a more or less distinct, rectangular reddish spot; posterior border rather narrowly ochreous pollinose. Third segment with the apex more broadly ochreous, increasingly so toward the sides; fourth segment wholly ochreous with the exception of an incomplete fascia on the basal sixth. Genitalia black, brownish-yellow pollinose. Pile bright yellow, black on the second and third segments except the sides and posterior borders. Venter very broadly reddish basally; on the sides, brownish-gray pollinose, yellow pilose, the fourth sternite almost all black haired.

Three ♂, Mt. Kinabalu, Kamborangah, 7200 ft., March 25, and April 18, 1929 (H. M. Pendlebury). The type is dated March 25.

Genus *Lathyrophthalmus* Mik.

*Lathyrophthalmus arvorum* Fabricius.

*Syrphus arvorum* Fabr., Mant. Ins., 335, 1787.

♀, Labuan Island, Sept. 23, 1927 (Kloss and Pendlebury).

*Lathyrophthalmus nigroscutatus* de Meijere.

♀, Bettotan, near Sandakan, Aug. 3, 1927 (Kloss and Pendlebury).

I place this specimen here rather than under *tristriatus* de Meijere, because the basal abdominal segment is wholly pale in ground color. In this respect it agrees much better with the description of the abdomen of the male. Females of both species were unknown to de Meijere.

Genus *Eristalis* Latreille.

*Eristalis cerealoides* sp. n.

Related to *cerealis* Fabricius, but with the face and eyes largely black pilose; differs from *bicornutus* de Meijere in having the femora wholly yellowish pilose. Length, 15 to 16.5 mm.

*Female*. Face reddish, in the middle with a broad black stripe, wholly covered with thick brownish gray pollen, above the tubercle with a subtriangular brown pollinose area. Cheeks black, gray pollinose. Face with a broad, nasiform tubercle, rather deeply concave above, perpendicular below, more than one-third lying below the lower level of the eyes. Front wide, widening anteriorly, opaque black on the upper half, opaque brown in front, between the black and brown areas very broadly gray or brownish yellow pollinose; lunula shining reddish-brown, above it a weakly shining, poorly defined black spot in which is a weak, low tubercle. Pile abundant, wholly black. Occipital cilia black. Occiput grayish white pollinose, the orbits rather silvery. Pile of occiput, cheeks and face, yellowish, black on the middle of the face above the tubercle. Antennae black; arista reddish, with long yellow rays. Eyes with abundant, moderately long pile which is pale yellow below and becomes black on the upper fourth or more.

Thorax black in ground color; mesonotum brownish-gray or cinereous pollinose, immediately behind the suture with a broad, incomplete black fascia which is gently convex posteriorly; half way between the suture and the anterior margin with a narrower, incomplete, more or less brownish fascia. Pile reddish-yellow, moderately long, the sides of the mesonotum with shorter cinereous hair intermixed. Scutellum reddish; black pilose, the free border broadly yellow pilose.

Coxae and femora black, the apical third of the anterior four and fourth or less of the posterior pair, reddish. Tibiae reddish, the posterior pair black with the base broadly brownish-red. Tarsi black, the basal segment of the anterior pair and basal two or three segments of the middle ones, reddish. Pile of the legs reddish yellow; black on the posterior and front tarsi, the apical two segments of the middle tarsi and mostly so on the posterior tibiae. Legs slender; hind tibiae gently curved.

Wings strongly tinged with luteous or brownish-yellow except apically and posteriorly. Squamae brownish, with grayish-yellow bases. Halteres reddish-yellow.

Abdomen opaque black, with orange markings and shining fasciae. First segment cinereous pollinose, with thick, sub-appressed yellow pile. Second segment with a pair of very large, dull orange triangles which extend from the base at the sides to beyond the apical fourth, their inner ends broadly separated, rounded, their anterior edge gently concave, the posterior border almost straight but nevertheless slightly oblique. Pile yellow, black on about the apical half. Third segment with a narrow, transverse orange spot on either side basally, the fourth with narrower spots which are much less broadly separated in the middle, and sometimes very narrowly connected; apices of second to fourth segments narrowly orange. Third to fifth segments with a moderately broad shining black fascia across the middle; those on the third and fourth sometimes broadly dulled in the middle but never clearly interrupted. Pile black on third and following segments. Venter mostly reddish, cinereous or brownish gray pollinose, the pile yellowish.

Described from 14 ♀ from Mt. Kinabalu: 8 ♀, Marei Parei, 5,000 ft., May 1, 2, 1929; ♀, Pakka, 10,200 ft., March 23, 1929 and 5 ♀, Kamborangah, 7,200 ft., March 30, April 1, 1929 (H. M. Pendlebury). The type is from Kamborangah.

*Eristalis niger* Wiedemann.

Anal. Ent., 38, 1828.

2 ♂, 2 ♀, Bettotan, near Sandakan, July 25 and Aug. 13, 24, 1927 (Kloss and Pendlebury); ♀, Mt. Kinabalu, Kenokok, 3,300 ft., April 22, 1929 (H. M. Pendlebury).

*Eristalis collaris* de Meijere.

Tijd. v. Ent., li, 258, 1908.

♂, Kudat, Sept. 18, 1927 (Kloss and Pendlebury).

This species belongs to a group which is rich in species in America but has few representatives elsewhere. The group is characterized by small size, and the presence of

one or two yellowish, orange or whitish fasciae on the mesonotum. In *collaris* the pale bands are as wide or wider than the black fascia.

***Axona chalcopyga* Wiedemann.**

*Eristalis chalcopyga* Wiedemann, Ausser. Zweifl., ii, 178, 1830.

♂, Bettotan, near Sandakan, August 2, 1927; ♀, Samawang, near Sandakan, July 12, 1927 (Kloss and Pendlebury).

***Megaspis zonatus* Fabricius.**

*Syrphus zonatus* Fabricius, Mantis. Ins., ii, 337, 1787.

4 ♀, Mt. Kinabalu, Marei Parei, 5,000 ft., April 24. May 1, 2, 1929, (H. M. Pendlebury).

## XVIII.—SOME NEUROPTEROID INSECTS FROM THE MALAY PENINSULA.

By NATHAN BANKS.

(with forty figures).

The material sent is almost wholly from the Malay States of Selangor, Perak, and Pahang, but some is from the adjacent Siamese part of the Malay Peninsula. Some of it is from mountains up to 6,000 feet. It was largely collected by Mr. H. M. Pendlebury, though some insects were taken by Messrs. C. Boden Kloss, H. C. Abraham, M. R. Henderson, E. Seimund, and I. H. N. Evans. Altogether there are 107 species. Very little has been described or recorded from this area. Some years ago the late Mr. C. F. Baker spent a month or more at Singapore and sent me the *Neuroptera*.

In general the fauna is similar to that of India and Indo-China, but more particularly to that of Sumatra. Where the group has been published upon, as the *Perlidae* and *Berothinae*, there is little new; but in other groups about twenty-five per cent are new species. In the true *Neuroptera*, especially the *Myrmeleonidae* and *Chrysopidae*, many species are spread from India to the Philippines, and practically all of the genera are common to this general region. One notable exception is a species of *Phyllocentropus*, a genus hitherto known only from the United States.

### PERLIDAE.

*Kalidasia kraepelini* Klap.

From Pahang: Cameron's Highlands, 4,800 ft., Jan., March; Kuala Teku, December. One female is over 50 mm expanse. Described from Jor Camp between Perak and Pahang.

*Kamimuria kelantonica* Klap.

From Pahang: Sungai Tahan, December, and Kuala Teku, December. Described from "Kelantan Os. Malakka."

*Euryplox ochrostoma* Klap.

Pahang: Cameron's Highlands, 4,800 ft., March, Oct.; and Sungai Ringlet, 3,500 ft., March. Several females which agree generally with the description especially in having the very large ventral plate. Klapalek did not refer to this in his later work (Selys Monograph). It was described from "Presqu'île de Malacca."

*Neoperla luteola* Burm.

From Pahang: Sungai Tahan, Dec.; Johore: Lubok Kedondong, N.W. of Mt. Ophir, Nov.; Pahang: Lubok Tamang, 3,500 ft., June; Selangor: Kuala Lumpur, January.

March; Pahang: Kuala Teku, December; Kedah: Catchment Area, near Jitra, April; and Penin: Siam: Nakon Sri Tamarat, Khao Ram, Feb., March, May.

*Neoperla fallax* Klap.

From Pahang: Cameron's Highlands, 4,800 ft., March, Oct.; Gunong Tahan, Padang, 5,500 ft., Dec., and Perak: near Jor Camp, 4,200 ft., September.

*Neoperla minutissima* Enderl.

Selangor: Kuala Lumpur, January, March.

*Etrocorema ahenobarba* Klap.

From Perak: Batang Padang, Jor Camp, March, Sept., Pahang: Cameron's Highlands, 4,800 ft., January, Oct.; and Penin: Siam: Nakon Sri Tamarat, Khao Ram, March.

*Oodeia dolichocephala* Klap.

From Pahang: Sungai Tahan, December, Perak: Jor Camp, 2,000 ft., May, August, Sept., and Penin: Siam: Nakon Sri Tamarat, Khao Ram, March.

*Ochthepetina violaris* Enderl.

From Kedah Peak, 1,000-2,000 ft., 14 March.

*Ochthepetina aeripennis* Enderl.

One female from Pahang: Cameron's Highlands, 4,800 ft., March.

*Javanita fascipennis* sp. n.

Head and pronotum dark brown to black, thorax and abdomen pale yellowish, tip of abdomen black; setae dark on basal part; antennae very pale yellowish, basal joint darker; front and mid-legs mostly dark brown, but basal two-thirds of femora pale; hind legs have base of femur, apical third of femur, and the tarsi black, tibia almost white. Fore-wings slightly embrowned at base, then rather yellowish at least on front part to near anastomosis, just before the anastomosis out to near tip is a broad dark brown band, the extreme tip hyaline-white; hind-wing similar, but the brown is not so dark and the basal costal area not as pale, the extreme tip is hyaline-white; venation of both pairs dark in dark parts, and pale in pale areas. Head fairly broad, and eyes well arched; ocelli small, more than twice their diameter apart, and about as far from the eyes; boss small, much in front of the ocelli and close to the eyes. The pronotum much broader in front than behind, about as long as broad behind, with three carinae near middle, the sides rugose. Wings rather narrow, costal cross-veins faint, radial sector beyond anastomosis with one branch; six or seven median and also cubital cross-veins; setae as long as abdomen.

Expanse 16-17 mm.

From Penin: Siam: Nakon Sri Tamarat, Khao Ram, Feb., March.

**Nemoura atrissima** Samal.

From Pahang: Cameron's Highlands, 4,800 ft., March, Oct.; and Gunong Tahan Padang, 5,500 ft., December.

**SIALIDAE.****Hermes sumatrensis** Weele.

From Kedah Peak: 3,000 3,930 ft., March; Selangor: Ginting Simpah, and Perak: Batang Padang, Jor Camp, 1,800 ft., June.

**Hermes maculipennis** Gray.

From Pahang: Kuala Teku, 16 February, one specimen; it is more common on Java.

**Neochondriodes sundicus** Weele.

From Perak: Batang Padang, Jor Camp, 1,800 ft., March, and Selangor: Kuala Lumpur, 7th. mile Cheras Road, 28 April.

**Neochondriodes simplex** Walker.

One from Pahang: Gunong Tahan Padang, 5,550 ft., 30 Nov.

More common to northward.

**ITHONESIDAE.****Rapisma viridipennis** Walker.

From Pahang: Sungai Ringlet, 3,500 ft., March; Fraser's Hill, 4,200 ft., Sept., and Penin: Siam: Nakon Sri Tamarat, Khao Luang, 2,000 ft., March.

The dried specimens are yellowish rather than greenish; two have a few dark dots on the fore wings.

**CHRYSOPIDAE.****CHRYSOPIINAE.****Ankylopteryx trimaculata** Girard.

From Selangor: Kuala Lumpur, Febr., March, June; Perak: Batang Padang, Jor Camp, 1,800 ft., May; Penin: Siam: Nakon Sri Tamarat, 8 April. Common in the Malay region; I believe that *A. sigillaris* Gerst. is the same form.

**Ankylopteryx polygramma** Gerst.

From Perak: Batang Padang, Jor Camp, 1,800 ft., March; Selangor: Kuala Lumpur, March; Pahang: Tahan River, December.

**Sencera anomala** Brauer.

From Kedah: Catchment Area, near Jitra, April.

I have seen no specimens from New Britain, but the many from Borneo do not differ from Malay Peninsular specimens, so I think that *S. scioneura* Navas is the same form. Brauer distinctly notes the absence of the divisory veinlet: it is hardly a good genus as *A. doleschali* Brauer has the cell extremely small.



**Nothochrysa aequalis** Walker.

Selangor: Kuala Lumpur, April; Langkawi Island, West Coast, April. Widely distributed.

**Nothochrysa ludekingi** Weele.

From Selangor: Kuala Lumpur, Nov.; Langkawi Island, West Coast, April. I think *N. ignobilis* Navas is the same. It differs from the rather larger *N. infecta* Newman (= *subcostalis* Navas) in having dark antennae.

**Leucochrysa abnormis** Albarda.

From Selangor: Kuala Lumpur, 2 Aug. Found in most of the Malay region, but never very common.

**Leucochrysa lunigera** Gerst.

From Pahang: Fraser's Hill, 4,000 ft., Jan. The third cubital cell is normally divided and differs also from *L. abnormis* by black outer gradates, several short cross-veins from radius to sector and several near origin of radial sector.

**Chrysopa splendida** Weele.

From Langkawi Isl., West Coast, April. Known from Java, Borneo, Philippines. *C. faceta* is the same form.

**Chrysopa rizali** Bks.

One from Kedah: Catchment Area, near Jitra, 10 April, and one from Selangor: Kuala Lumpur, Oct. is a very pale specimen but showing distinctly the dark dot between antennae. Known from Sumatra, Borneo Philippines.

**Chrysopa eurycista** Navas.

From Selangor: Kuala Lumpur, May. Known from various parts of Malay region.

**Chrysopa jaluutana** Kempny.

From Selangor: Kuala Lumpur, January, April, Oct. All four specimens have a pair of dark dots on the face, which I have not seen in any specimens from Oceania; but otherwise these agree closely with Fiji specimens. *C. deuterata* Navas is the same, and there are closely related forms in Australia. Weele records specimens under *C. vicina*.

**Chrysopa esakii** Petersen.

From Selangor: Bukit Kutu, 3,000 ft., April; and Kedah Peak, 3,300 ft., 24 March. It was described from Sumatra. I think *C. fascialis* Navas and *C. julia* Navas from Java are the same form; related to *atrionis*, but the gradates are dark.

**Chrysopa atrionis** Banks.

From Selangor: Kuala Lumpur, 2 Febr.; and Langkawi Isl., West Coast, April. Described from Singapore, and occurs in the Philippines.

***Chrysopa physophlebia* Navas.**

From Selangor: Kuala Lumpur, Sept.; Pahang: Fraser's Hill, 4,000 ft.; Perak: Batang Padang, Jor Camp, 1,800 ft., May.

***Chrysopa ochracea* Albarda.**

Selangor: Kuala Lumpur, June, Dec.; Langkawi Isl., W. Coast, April; and Penin: Siam: Nakon Sri Tamarat, Khao Ram, Febr.

Described from Sumatra and known from Java.

***Chrysopa crassoneura* Weele.**

From Pahang: Cameron's Highlands 4,800 ft., 17 Oct.

***Chrysopa nigribasis* Bks.**

Described from Island of Penang.

***Chrysopa necrota* Bks.**

Described from Singapore.

***Chrysopa winkleri* Navas.**

From Pahang: Gunong Tahan Padang, 5,500 ft., 22 Jan. Described from Borneo in a new genus, *Bornia*, because of the three series of gradates; the number of gradates of the middle series is variable and may be reduced to two; so I think it is hardly a generic character.

***Chrysopa neglecta* sp. n.**

Closely related to *C. ochracea* Alb.; pale yellowish throughout, but both pairs of palpi black; a faint red spot on cheek under eye; antennae pale, but beyond middle becoming brown, nearly as long as wings. Pronotum broader than long, scarcely narrowed in front. Wings moderately long and narrow, stigma pale yellowish, veins wholly pale, or sometimes one or two gradates faintly darker, and two or three cross-veins near base of wing dark; divisory veinlet ends beyond the cross-vein, 13 to 14 cross-veins between radius and sector; fore-wing with gradates parallel, and about as near each other as each to margin and to sector, seven in inner series, eight or nine in outer series, over 20 costals, costal area moderately slender; in hind wings five or six inner, and seven outer gradates.

Expanse 28 to 30 mm.

From Pahang: Cameron's Highlands, 4,800 ft., Oct., March, June.

***Chrysopa perturbata* sp. n.**

Pale yellowish; black spot each side under eye, a narrow reddish line from edge of clypeus to eye, a reddish spot from upper base of antennae to eyes; antennae and palpi unmarked. Mesonotum with a large dark red-brown spot each side, narrowly connected in middle, and each side extended out in a reddish mark on extreme base of wing. Venation pale, legs pale, unmarked. Wings rather long and narrow, acute at tips; radial sector but little curved, second cubital cell long, not much swollen above, divisory veinlet

ending beyond cross-vein above, cubital cross-veins at end of third cubital cell and three beyond oblique; ten radial cross-veins; six to seven in gradates, the two series parallel, the first about as near radial sector as to second series, hind-wings slender, unmarked; three or four inner gradates, five or six outer, inner series nearer to radial sector than to second series. Pronotum short, much narrowed in front.

Length fore-wing 10 mm., width 3.8 mm.

From Selangor: Kuala Lumpur, 5 May.

The species of *Chrysopa* from this region are tabulated below.

- |  |   |
|--|---|
| 1—With three series of gradates in fore-wing, body unmarked .. .. .  | <i>winkleri</i> .                           |
| With but two series of gradates in fore-wing ..  | 2   |
| 2—Antennae black, basal joints pale, pronotum rather broad .. .. .   | 3   |
| Antennae pale, except toward tip .. .. .   | 4   |
| 3—Fore-wings more than 15 mm., pronotum bordered with reddish, gradates usually dark .. .. .                                 | <i>ruficeps</i> .                           |
| Fore-wings less than 15 mm., pronotum usually not bordered, gradates usually pale .. .. .                                    | <i>eurycista</i> .                          |
| 4—Two short dark stripes on vertex, and a transverse dark line across posterior part of pronotum, wings not spotted .. .. .  | <i>jaluitana</i> . ( <i>deutera</i> Navas). |
| No such marks .. .. .  | 5   |
| 5—Wings with golden iridescent spots near tips, when viewed obliquely; many dark marks on the wings .. .. .                  | <i>splendida</i> .                          |
| No such golden spots .. .. .   | 6   |
| 6—Mesothorax with black marks .. .. .  | 7   |
| Thorax without black marks .. .. .   | 10  |
| 7—Median and lateral dark stripes on the pronotum, many veins black in basal part .. .. .                                    | <i>necrota</i> .                            |
| Pronotum without median dark stripe .. .. .  | 8   |
| 8—Pronotum dark on sides, many broadly margined veins, mostly in the apical part of fore-wing, stigma plainly yellow .. .. . | <i>rizali</i> .                             |
| Pronotum not dark on sides .. .. .   | 9   |
| 9—Costal area at base very broad, and costal vein dark for several cross-veins .. .. .                                       | <i>nigribasis</i> .                         |
| Costal area at base, rather slender and narrowed, costal vein not dark, veins mostly pale .. .. .                            | <i>perturbata</i> .                         |
| 10—Outer gradates swollen as also base of the outer forks, veins mostly pale .. .. .   | <i>crassoneura</i> .                        |
| Outer gradates not swollen .. .. .   | 11  |
| 11—Gradates black or brown .. .. .   | 12  |
| Gradates pale as other veins .. .. .   | 14  |

- 12—Face marked with several red spots and lines,  
second joint of antennae rather dark, basal  
joint with streak on outer side, small  
species .. .. . *esakii*.  
Face not so marked .. .. . 13
- 13—Dark dot between bases of antennae; traces of  
dark on thorax or wings .. .. . *rizali* (pale).  
No such dark dot; female with several veins toward  
base swollen .. .. . *physophlebia*.
- 14—Palpi wholly pale, no marks on face .. .. . *ochracea*.  
Palpi marked with dark .. .. . 15
- 15—Face much marked with red or almost black, basal  
joint of antennae dark or partly so .. .. . *atrioris*.  
Face barely if at all marked with red, antennae  
pale, unmarked .. .. . *neglecta*.

## APOCHRYSINAE.

The Indomalayan genera of *Apochrysinæ* can be separated as follows:

- 1—Costal area of fore-wings, and the cubital area also  
of but series of cells .. .. . 2  
Costal area and cubital area of two or more series of  
cells .. .. . *Joguina*.
- 2—First gradate series runs up obliquely to the radial  
sector .. .. . *Synthochrysa*.  
First gradate series bends and runs parallel to the  
radial sector .. .. . *Nobilinus*.

*Synthochrysa* (of which *Oligochrysa* is a synonym) contains three species, *evanida* Gerst., *stigma* Gir., and *gracilis* Pet.

*Joguina* contains besides the type species, *nicobarica* Brauer, only the new species, *malayana*.

*Nobilinus* contains several forms. *N. aurifera* from Ceylon has the first spot before or at middle, in others beyond the middle. *N. insignata* Navas and *N. phantoma* Gerst. have very broad wings, with large round dark spot, the apical spot absent. *N. albardae* McLach., *N. coccinea* Brauer and *N. bellula* Bks. are very similar, usually showing a small apical spot, and the first spot rather elongate. The differences described in marks of head and thorax may not be constant, and all be but one species.

***Joguina malayana* sp. n.**

Pale yellowish face, part of vertex, and basal joint of antennae reddish; thorax wholly pale; last two segments of abdomen brown, the two segments before these black, base of abdomen pale; legs wholly pale. Fore-wing with rounded black spot before middle on first gradate series, and another not much smaller toward tip, a few veinlets

near these spots and some outer gradates black, else venation pale, hind wing with spot toward tip, none on first gradate series; the latter series, the outer gradates, and a few veins near the spot black, other veins pale. Costal area of fore-wings with the cells divided by a series of cross-veinlets for most of distance, between radius and its sector also two series of cells for most of the distance, the middle area of wings irregularly divided into many cells, so one cannot distinguish gradate series except by the spots thereon, behind the cubitus to the margin there are also two or three or in parts four rows of cells. In hind-wings the costal area is simple, between radius and its sector there two cells in a few places, in the middle area of wing many cells, but not as many as in fore-wings, behind cubitus to the margin there are two or three series of cells for part way; the hind-wings are much narrower and a little longer than the fore-wings.

Length fore-wing 25 mm., width 12 mm.

From Selangor: Kuala Lumpur, Sept., and Negri Sembilan: Bukit Tangga, Sept. Differs from *J. nicobarica* Brauer in having but one spot in hind-wings and the costal area of fore-wings with but two series of cells, and near the stigma with but one series.

## HEMEROBIIDAE.

### HEMEROBIIINAE.

*Micromus morosus* Gerst.

Kedah Peak, 2,500-3,000 ft., May; Selangor: Bukit Kutu, 3,500 ft., Sept. Known from Java.

*Micromus pusillus* Gerst.

Selangor: Kuala Lumpur, Feb., March, July, Nov., Dec. Known from Sumatra, Java, Philippines, etc. *M. callidus* Hagen is very closely related, but the fore-wings are more heavily marked with brown, and veins more spotted.

*Hemerobius frontalis* Hagen.

From Pahang: Fraser's Hill, 4,000 ft., Jan. A little darker than Hagen's types, but have the long face, and the venation the same; the third radial sector forked four times. *H. sumatranus* Navas seems to agree, having the face marks, the marks on vertex, and the venation the same.

*Hemerobius incursus* sp. n.

Face short, not produced below as in *H. frontalis*; pale yellowish, a faint spot each side near eye beneath; palpi marked with black; antennae pale yellow; vertex pale, unmarked; pronotum pale with dark sides; legs pale yellowish to white; wings with pale veins, streaked with dark brown, gradates and several cross-veins near base dark, a larger spot where medius and cubitus are connected; faint clouds

here and there on wing, the base behind largely clouded, but mostly near cross-veins and gradates; hind wings unmarked except tips of a few veins near apex dark; stigma not distinct in either pair. Costal area of fore-wing moderately broad; three radial sectors, the third forked three times; five inner gradates, the second (from behind) more basad than others; six or seven outer gradates. In hind-wing three inner and six outer gradates, all rather scattered.

Expanse 14 to 15 mm.

From Pahang: Gunong Benom, 6,000 ft., 27 July to 4 August.

#### BEROTHINAE.

##### *Acroberotha nicobarica* Navas.

From Langkawi Islands, West Coast, Malay Penin., 15 April; Selangor: Kuala Lumpur, 28 Oct.; Pulau Lallang, West Coast, Malay Penin., 23 Nov., N. Borneo: Samawang, 9 July; N. Borneo: Bettotan, 17 Aug. The number of branches to radial sector varies from seven to nine; the Bornean specimens do not differ from the Malayan ones.

##### *Berotha borneensis* Navas.

From North Borneo: Bettotan, 16 Aug.; and Malay Penin: Kedah Peak, 3,000 ft., 28 March. I see no difference in these specimens; the gradates are the same; I have seen no Formosan specimens, but doubt if *puncticollis* is different.

##### *Berotha piepersi* Weele.

From North Borneo: Kudat, 5 Sept.; and Malay Penin: Kedah, Catchment Area, near Jitra, 3-6 April. Also occurs in Java and the Philippines; it may be only a form of the Indian *B. insolita*, but the wing apex is rather more bluntly truncate, quite distinct from *B. indica* which I have seen only from Ceylon.

#### OSMYLIDAE.

##### *Spilosmylus conspersus* Walk.

From Selangor: Bukit Kutu, April; Perak: Batang Padang, Jor Camp, 1,800 ft., Sept., and Oct. and Pahang: Sungei Ringlet, 3,500 ft., March. The male differs from the female (= *tuberculatus*) in that there are two cubito-median cross-veins before fork of median, and in having spots between subcosta and radius and extending forward into the costal area.

#### DILARIDAE.

##### *Rexavius marmoratus* sp. n.

Pale yellowish, clothed with yellow hair; legs pale, dark at tip of femora, middle and tip of tibiae, and tip of tarsal joints. Antennae of male with 21 joints with long processes, the joints longer than in *R. nietneri*, but not as long as in typical *Dilar*. Wings faintly marked with narrow

wavy brownish bands across, a distinct cloud over the second chitinous dot, many cross-veins dark, and also forkings dark. First chitinous dot much before fork of median, second dot plainly before second branch of second radial sector, the two dots closer than in most species, and the first nearer to base of wing than in any other Asiatic species. Between radius and second radial sector six to eight cross-veins, between median vein and its fork two veins, also two between median fork and cubitus, and two between cubitus and its fork, and one between cubital fork and first anal, and one from first to second anal; inner gradate series of six or seven veins, outer of six to eight. The two series of gradates are further apart than in *nietneri*. Female paler than the male (perhaps not fully colored), the ovipositor as long as abdomen and thorax. Related to *R. nietneri*, but the wings more slender, and thus the branches of cubitus and cubital fork to margin are shorter. The brown bands on fore-wing also separate it from typical *R. nietneri*, though one of the types has many brown marks, but irregularly arranged.

Length fore-wing ♂ 9.5 mm. ♀ 7.5 mm.

From Peninsular Siam: Nakon Sri Tamarat, Khao Luang, 2,000 ft., March.

### CONIOPTERYGIDAE.

#### *Malacomyza cerata* Hagen.

From Pahang: Gunong Tahan Padang, 5,500 ft., Dec., Selangor: Kuala Lumpur, Aug.; Selangor-Pahang border, The Gap, 2,700 ft., Aug.

### MANTISPIDAE.

#### *Euclimacia simulatrix* McLach.

One from Kedah Peak, 2,000–3,000 ft., 30 March; also from Singapore (Baker coll.). A very striking species.

#### *Eumantispa strenua* Gerst.

From Malacca: Rim, Feb., and Perak: Gunong Kledang, Nov., rather widely distributed.

#### *Eumantispa quadrituberculata* Westw.

Selangor: Kuala Lumpur, Febr.; known from various parts of India.

#### *Mantispa amabilis* Gerst.

From Pahang: Kuala Teku, 9 Dec. and Langkawi Islands, West Coast of Malay Penin., 25 April. Fairly widely spread.

#### *Mantispa annulicornis* Gerst.

From Selangor: Permatang Est. Banting, 3 May; Johore: foothills near Mt. Ophir, Oct.; Pahang: Kuala Lipis, 28 May; Selangor: Kuala Lumpur, 10 June; Pahang: Jerantut, Batu Balei, March; and Anamba Island, South China

Sea. Very common in the Malay region, and quite variable in size and the amount of markings, but pattern constant.

### MYRMELEONIDAE.

#### Genus *Phanoleon* gen. n.

A *Dendroleonini* (with radial sector much before the cubital fork, second anal running in even curve, basal fork to cubitus, legs extremely slender). Spurs equal two tarsal joints, basal tarsal joint equal to fifth; pronotum very slender. Generally near to *Dendroleon*, but the fore-wing broad, the costal area very broad, even more so than in *Borbon* and *Nuglerus* but at once separated from these and *Dendroleon*, *Neglurus*, etc. by a double series of costal cells, the lower series are less numerous and broader than the upper series, the two series extends almost to the base of the wing. Hind wings longer than fore-wings, acute at tip, costal area slender, one-celled, one cross-vein before radial sector. Antennæ slender, clavate, palpi short. Genotype, the following species:—

#### *Phanoleon bicostatus* sp. n. (Fig. 24.)

Head pale, a broad shining black band above and below antennae, vertex brownish; palpi pale; antennae annulate with dark, long and slender. Pronotum pale above, a faint median dark stripe, hardly evident in front, the lower sides and pleura deep black which extends back across the pale meso- and metapleura as a broad black stripe; thoracic notum mostly black, the scutelli more or less pale; abdomen dark on tip, pale on base with two broad dark bands; legs pale, all femora with dark median and apical bands, premedian band on tibial and faintly at tip, tarsi with apical joints dark. Hair of pronotum long, erect, mostly black, that of legs long, scattered, mostly white.

Venation largely brown, longitudinal veins often white in streaks, and the cross-veins sometimes wholly pale (not dotted). Behind the radius some cross-veins margined with brown, and a long oblique brown streak up from rhexma, a curved streak at end of anal vein, some spots beyond, near hind margin, the outer edge of the pale stigma and some spots behind and obliquely outward dark; between the subcosta and radius a series of dark spots; hind wings with venation largely brown, some scattered brown spots near tip, rhexma, and outer hind margin.

Abdomen much shorter than hind-wings; pronotum twice as long as broad. Fore-wings rather broad toward tips, hind-wings narrowed, slightly concave on outer margin toward tip, no cross-veins in apical areas, venation here very dense; in fore-wing three cross-veins before radial sector in each wing.

Length: fore-wing 23 to 28 mm; hind-wing 25 to 31 mm.



Two specimens, larger one marked Malay Penin: other Kedah: Catchment Area, near Jitra, 5 April.

The related genera of *Dendroleonini* from this general area can be tabulated as follows:

- |   |                     |
|---|---------------------|
| 1—Costal area of fore-wings very broad .. ..  | 2                   |
| Costal area not especially broad .. ..  | 4                   |
| 2—A double costal series of cells in the fore-wing <i>Phanoleon</i> .<br>Only a single series of costal cells .. ..   | 3                   |
| 3—A distinct banksian line in fore-wings; one cross-vein<br>before radial sector in hind-wings .. ..                  | <i>Borbon</i> .     |
| No distinct banksian line, just the outer beginnings;<br>two cross-veins before radial sector in hind-<br>wings .. .. | <i>Nuglerus</i> .   |
| 4—Second and third anals united at one point .. ..  | <i>Acratolen</i> .  |
| Second and third anals only connected by a cross-<br>vein .. ..   | 5                   |
| 5—Outer margin of fore-wing concave; one cross-<br>vein between first and second anals, large<br>species .. ..        | <i>Neglurus</i> .   |
| Outer margin of fore-wing scarcely if at all concave;<br>two cross-veins between first and second<br>anals .. ..      | <i>Dendroleon</i> . |

*Gatzara* is scarcely different from *Dendroleon*, *Bofia* equals *Nuglerus*, *Bullanga* and *Cuca* I do not know but are evidently related to *Dendroleon*, both have a single costal series.

My *Dendroleon sumatranum* is the same as *Borbon regius*, less plainly marked. *Dendroleon javanus* will also go in *Borbon*.

#### *Nuglerus maculatus* Navas.

One from Selangor: Bukit Kutu, 3,000 ft., 17 April.

Described in genus *Bofia*; I have a photograph of the type of *Nuglerus scalaris*, said to be from Brazil. It is almost identical with this specimen of *Bofia maculatus*. The cross-veins between the cubital and anal veins are all more or less as in *maculatus*, and all equally marked with black, while in *scalaris* a few cross-veins are not oblique and are not margined with dark, while the oblique ones are more heavily marked than in *maculatus*. It is highly improbable that such closely related species can come from South Asia and Brazil.

#### *Neglurus vitropennis* Navas.

From Selangor: the Batu Caves and vicinity, August, Sept.

#### *Distoleon dirus* Walker.

Several from Selangor: Kuala Lumpur, Jan., May, June, July, Nov.; and Langkawi Islands, West Coast, May.

**Neuroleon sp.**

One specimen from Langkawi Island, West Coast, April.

Possibly near to *Salvaza cornuta* Navas from Tonquin, Indo-China, but several statements in description do not fit very well.

**Pseudoformicaleo jacobsoni** Weele.

Several from Selangor: Kuala Lumpur, Febr., June, and July at light, and Langkawi Islands, April. Petersen has placed as synonyms *Tahulus caligatus*, *T. asthenicus*, and *T. ignobilis* all of Navas, and the descriptions agree very well with these specimens. I however doubt very much if the Australian *P. costatus* is the same. I have but one specimen of *costatus*; in this the marks are clustered so that there are large pale areas; for example, before the stigma on both wings there is a large pale area, and the subcosta and radius unmarked, while in *jacobsoni* there are dark marks all over the veins leaving only very small pale areas. The wings are more slender than in the Australian species.

**Indoleon tactitus** Walk.

Several from Selangor: Kuala Lumpur, March. One of the most handsome species of the family.

**Hagenomyia eurystictus** Gerst.

From Selangor: Gombak Valley, Oct.; Perak: Batang Padang, Jor Camp, 1,800 ft., February.

The type was from Rangoon; it also occurs in Java and the Philippines.

**Hagenomyia nicobaricus** Brauer.

From Selangor: Kuala Lumpur, Jan.

Type was from the Nicobar Islands, and it also occurs in New Guinea, Philippines, and other islands. The *M. papuensis* Weele is, I believe, the same form.

**Hagenomyia sumatranus** Weele.

From Langkawi Islands, West Coast, Malay Penin., April; smaller than the other species.

The type was from Sumatra, and it also occurs in Celebes, Siam, and Indo-China. The *M. celebensis* Weele and *M. nitens* Navas I consider the same form. *M. nigrinus* Petersen is a dark form with lateral prothoracic spot only in front; of two specimens from Lombok one is *nigrinus*.

The three species of *Hagenomyia* found in this region are widely distributed, but are often confused; they can readily be separated by the markings of the pronotum (Fig. 30).

1—Pleura wholly dark; pronotum with only the anterior lateral corners pale; lower face pale, not spotted;

upper face from below antennae and including vertex wholly dark, no pale spots; spurs plainly longer than basal tarsal joint .. *eurystictus*.

Pleura pale, marked with a dark stripe .. .. 2

2—Lateral margin of pronotum broadly pale, a more or less distinct narrow pale median stripe; often spots on clypeus, and the vertex spotted with pale .. .. *sumatranus*.

The lateral margin pale only in front, the pale mark extending obliquely back and tapering, where it is sometimes connected to a small pale spot near the posterior angles; clypeus with one or two dark spots; vertex spotted, but often mostly dark .. .. *nicobaricus*.

#### **Myrmeleon celebensis McLach.**

Several from Selangor: Kuala Lumpur, in Jan., Febr., and May; Perak: Taiping, June; Langkawi Islands. West Coast, Malay Penin., April.

This is readily separated from *frontalis* by having five cross-veins before the radial sector in hind wing and that the first two or three are bent at upper end; in *frontalis* four unbent cross-veins.

#### **Sogra negligens Navas.**

From Langkawi Islands, West Coast, April. Fairly widely distributed in Indo-China.

### **PANORPIDAE.**

#### **Neopanorpa infuscata sp. n. (Fig. 26a.)**

Black; rostrum and legs pale, tarsi darker; antennae black, basal joint pale; meso- and metanotum with large pale spot each side; last three segments of male abdomen pale, as also extreme tips of three preceding segments. Wings dull, sordid to fumose, apex of wing from base of stigma usually pale dull brownish, with a large white spot behind stigma containing two or three hyaline cross-veins, a more or less evident spot or band over first chitinous dot, and an oblique mark or band before it; hind wings dark at tip, none of the apical marks with definite margins, and sometimes but little darker than rest of wings, but the stigma always wholly dark brown. The process of the third segment triangular and reaching about two-thirds across fourth segment; eighth segment not very broad, the ventral appendages long and entire.

Female marked as the male.

Length of fore-wing 13 mm.

From Perak: Batang Padang, Jor Camp, 1,800 ft., May, June; also Pahang: Lubok Tamang, 3,500 ft., June; and Penin: Siam: Nakon Sri Tamarat, Khao Luang, 2,000 ft., March.

Distinguished by generally dull wings and indistinct marks and the shape of the ventral appendages; these are much as in Van der Weele's figure of *P. augustipennis*, but the wings are very differently marked, and he does not mention the spots on thorax; I think that his *P. augustipennis* is but a form of *P. mulleri*.

***Neopanorpa augustipennis* Westw. (Fig. 26).**

From Pahang: Lubok Tamang, 3,500 ft., Perak: Batang Padang, Jor Camp; 1,800 ft., Selangor: Gombak Valley; and Penin; Siam: Nakon Sri Tamarat, Khao Luang, 2,000 ft., taken in Feb., March, June, Oct.

Westwood states that the thorax has four pale spots; what Van der Weele and apparently Petersen identify as this species has no spots. The wing marks are very variable, but several match Westwood's figure. The basal mark is nearly always evident, though often faint, the forked band is often broken into spots. The ventral appendages of the male are excised at about middle as shown in figure, very different from Van der Weele's figure. A series of heavily marked specimens were taken at Sedagong, (Pulau Tioman), some are as heavily marked as the figure of *R. formosanus*. *N. claveri* is probably the same form

## TRICHOPTERA.

### SERICOSTOMATIDAE.

***Goerodes abrupta* sp. n. (Fig. 40.)**

Generally similar in color to the other species but rather more yellow; the fore-wings with three hyaline white spots; one in subcostal area before end of subcosta, one over connection from fork 2 to fork 3, and one toward base, just before the forking of median vein. The venation is similar to that of other species except near the arculus; here the connection from anal to fork 5 is much as in *ursina*, that is near the base of fork 5, but the cubitus before fork 5 is more sinuate and the first anal also sinuate so as to make the two veins approach each other closely, almost forming a cell before fork 5 above arculus; the second anal just misses the hind margin. In hind wing fork 2 about one-half way back on discal cell, and forking of median vein scarcely before base of discal cell.

Expanse 12 mm.

From Perak: Batang Padang, Jor Camp, 1,800 ft., 10 March; two females. Closely related to *ursina*, but smaller, and curving of cubitus and first anal different.

***Goerodes continuata* sp. n. (Fig. 39.)**

Yellowish-brown, clothed with black and yellow hair, giving it a generally even pale brown appearance; abdomen dark brown; legs pale; antennae annulate. Very similar to *G. ursina* Hagen; fore-wings rather darker and plainly a little more slender; two hyaline spots, one over the

connection from fork 2 to fork 3, and one before forking of median vein. Venation very similar to that of *G. ursina*, except in the anal region near arculus; the connecting veinlet from anal to fork 5 appears as a continuation of anal and runs into lower side of fork 5 nearly one-half way out on the fork; the cubitus before fork 5 is sinuate as in *ursina*, but the first anal is also curved in the same way so that the cell is not narrowed; the second anal runs into the hind margin before it runs into the arculus (in *ursina* missing margin). In hind-wings fork 2 is from one-third to nearly one-half way back on discal cell, and the forking of median barely before discal cell.

Expanse 14 mm.

From Pahang: Cameron's Highlands, 4,800 ft., Jan., March, June, Oct., and Gunong Tahan, 5,500 ft., Dec.; all are females.

In the series of *G. ursina* Hagen are no males, but the first specimen of *G. vulpina* is a male; the females with it appear to be the same as *G. ursina*. I am therefore inclined to believe them the same. In the male *vulpina* the venation is somewhat different from the female, but not near as much so as in *G. cornigera*. *G. continuata* and *G. abrupta* are so similar to the female *ursina* that I cannot believe that the two species of *Goerinella* that are based on males, are the males of the two species of *Goerodes*, although in one case they are from the same localities. It however looks strange that the two *Goerodes* are only females, and the two *Goerinella* are only known from males.

*Goerinella venularis* sp. n. (Figs. 34, 36.)

Yellowish, clothed with gray to brown hairs and scales giving it a generally gray appearance. Palpi of male recurved, clothed with dark gray hair; basal joint of antennae elongate, straight, as long as width of head, densely gray haired, beyond pale, annulate with dark. Wings clothed with scales and fine hair; scales most densely placed on the veins, the veins themselves in fore-wing heavier than usual; some of the cells in basal middle with few scales, the long anal vein very heavy, except tip where it is forked (possibly formed of two veins united). Hind-wings also with scales and many fine hairs, but the veins less prominent. Venation of hind wings very similar to that *G. piscina*. In fore-wing no folded basal area on costa, and the connection between median and cubitus is much further out, and the cubitus runs into the anal shortly beyond the cross-veins; in shape the fore-wing is more blunt at tip, the outer part of costa not as sloping as in *G. piscina*. Legs very slender, tarsi dark.

Expanse 14 mm.

From Pahang: Cameron's Highlands, 4,800 ft., Jan., March, June.

**Goerinella posticata** sp. n. (Figs. 35, 37, 38.)

Pale yellowish; antennae pale, beyond basal joint annulate with dark, basal joint greatly elongate, somewhat curved, in middle of front part with a large patch of black hair, the hair at tip especially long and clustered; palpi recurved, densely clothed with long hair, that on the outer side pale, on the posterior side mostly black; labial palpi pale, slender; legs rather brownish, tarsi darker. Wings clothed with yellowish and black hairs and scales, a dense row of black hairs just above posterior vein; fringe dark, scales placed mostly on the veins, the costal area with some scales, but other cells with few if any scales, densely hairy. The space before cubital cross-vein mostly bare. Hind-wings densely hairy and with scales on veins. Fore-wings with the anal vein subparallel to the hind margin curved up and ending near tip of wing; the cubitus and median branches are somewhat crowded and run into the anal vein. Venation of hind-wing generally as in *G. piscina*, but the discal cell is very much smaller and the cubitus, although approaching the median fork does not come as near as in *G. piscina* nor *G. venularis*, and the first anal is more remote from the cubitus.

Expanse 14 mm.

From Pahang: Gunong Tahan Padang, 5,500 ft., 16 Dec., and Cameron's Highlands, 4,800 ft., 13 Jan.

**Goera uniformis** sp. n. (Figs. 28, 29.)

Pale; head with mostly long pale hair; palpi largely black-haired on outside, pale nearer tips; basal joint of antennae rather rufous, with dark hair, beyond pale yellowish; abdomen brown, segments margined with pale; legs pale brown, spurs darker. Fore-wings yellowish-brown, with black and yellow hair, the longer, black hairs mostly on the veins. Hind wings fumose, the veins darker, fringe dark. Venation of fore wing similar to others; fork 1 back on discal almost half-way, fork 2 has a short pedicel, fork 3 short, with a very long pedicel, fork 5 bent up at base so that it is very close to the lower branch of median. In hind wings the discal cell is open, fork 1 further back than fork 2, fork 3 short, shorter than its pedicel due to the fact that the cross-vein between median and radial sector is near base of discal cell, fork 5 hardly larger than fork 3. there is no cross-vein between cubitus and median for the cubitus out to middle is so near as to be almost united to the median.

Expanse 16 mm.

From Penin: Siam: Trang, 24 April.

**CALAMOCERATIDAE.****Ganonema brunneum** Ulmer. (Fig. 22.)

Several from Kedah Peak, 3,300 ft., 27 March; Pahang: Cameron's Highlands, 4,800 ft., 12 Oct.; Penin: Siam:

Nakon Sri Tamarat, Febr. The male has the fore-wing with many erect hairs, especially dense along the costal area; the hind femora slightly fringed beneath, the tibiae and tarsi densely long haired, the hair somewhat appressed and of a pale yellow; the hind tibia are curved (concave on hind edge). Both females have the fork 3 pedicellate, otherwise they agree with Ulmer's figure. Described from Sumatra.

**Ganonema brevipenne** Ulmer.

One from Pahang: Kuala Lompat, 1 July. It has fork 7 further back on discal cell than any that I have seen; known from Ceylon, India, Borneo, etc.

**Ganonema magnum** sp. n. (Figs. 32, 32a, 33, 33a.)

Yellow brown. Head, palpi, and basal joint of antennae densely clothed with long yellow brown hair, two tufts below each eye; tufts of similar long hair on pronotum, and on middle and posterior part of mesonotum; pleura mostly smooth and bare, but with a few tufts of long hair, coxae with rows of long hair; antennae beyond base marked with dark, mostly at tips of joints; abdomen brown. Legs yellow brown, clothed with yellowish-brown to brown hair; on front legs mostly short, on hind and mid legs mostly very long, in male that on posterior side on these tibiae is from 8 to 10 or more times longer than the width of the joint, in the female these tarsi are clothed with yellow hair, the tips marked by black hair. Fore-wings densely clothed with appressed hair; in male with much yellowish, and some black in places, giving the wing a generally dark brown appearance, in female with mostly black hair, the costal edge, however, yellowish, fringe of hind wings black. In both sexes the maxillary palpi are held recurved in front of the face. Fore-wings rather long, venation as figured, similar to that of other species.

Length of fore-wing 19 mm., width 6 mm.

From Pahang: Cameron's Highlands, 4,800 ft., 11 March.

**Asotocerus fuscipenne** Albarda.

From Kedah: Catchment Area near Jitra, April; and Pahang: Cameron's Highlands, 4,800 ft., 5 Dec. Known from Sumatra and Annam.

**LEPTOCERIDAE.**

**Oecetis languinosa** McLach.

Two females from Pahang: Cameron's Highlands, 4,800 ft., 26 Jan., agree with the description of this species from Celebes, but a male might show them distinct.

**Oecetinella confluens** Ulmer.

From Pahang: Lubok Tamang, 3,500 ft., 16 March. Widely spread in Malay region.

**Oecetina pretiosa** Bks.

From Selangor: Kuala Lumpur, 13 Febr., and Pahang: Sungai Tahan, 21 Nov. Known from India.

**Leptocella maculata** Bks.

From Selangor: Kuala Lumpur, 26 April; and Penin: Siam: Patalung 19 May, and Trang 23 April. Described from India.

**Notanatolica giloloensis** McLach.

Selangor: Ampang, Oct.; Pahang: Sungai Ringlet, 3,500 ft., 7 March, and W. Java: Preanger Regency, Buitenzorg 600 ft., April 1923.

**Sitodes argentifera** McLach.

Pahang: Cameron's Highlands, 4,800 ft., 14 June. Rather widely distributed, mostly in India.

**HYDROPSYCHIDAE.****Stenopsyche ochreipennis** Albarda.

From Pahang: Gunong Tahan Padang, 5,500 ft., 12 Dec.; Kedah: Catchment Area near Jitra, 8 April; and Penin. Siam: Nakon Sri Tamarat, Khao Ram, April and May.

**Amphipsyche vedana** Banks.

From Perak: Taiping, 16 Dec.; and Penin. Siam: Nakon Sri Tamarat, Khao Ram, Febr. Described from India.

**Amphipsyche minima** sp. n. (Fig. 31.)

♀. Pale whitish or in parts pale yellowish; antennae faintly dark at tips of joints, face with a silvery white spot each side by eyes; thoracic notum rather reddish; abdomen black with pale band at tips of segments. Wings hyaline whitish, clothed with fine yellow hair, in the anal area densely hairy giving it a yellow tinge; vein on upper side of fork 3 distinctly margined with brownish-yellow, and a brownish shade over anastomosis and continuing across the median cell. In fore-wings both fork 1, and 2 are long pedicellate. Hind wing similar to *A. proluta*, except no cross-vein above fork 5, and the stem of fork 3 is geniculate at its origin. Tibia and basitarsus of second leg greatly broadened, basitarsus about two-thirds as long as tibia, second tarsal joint only about one-third of basitarsus and not one-half as wide, third joint scarcely broadened, fourth and fifth not at all.

Expanse 17 mm.

From Malay Penin: Kedah, Catchment Area near Jitra, 9 April.

**Macronema spectabilis** sp. n. (Figs. 5, 11.)

♂. Head clear yellowish, face next to eyes silvery; basal joints of antennae yellowish, beyond some joints marked with brown, palpi pale; third joint dark; legs pale yellowish, front tibiae black, tips of mid and hind tibiae



dark, apical spurs brown, others yellowish; thoracic notum black, a yellow spot each side near base of fore-wings; abdomen brown. Fore-wings mostly black, with white spots; three costal ones, two smaller in apical area, one behind near hind margin and a streak in basal posterior part, partly interrupted; hind-wings dull brownish, the costal part for over one-half way and a costal spot toward tip white. Discal cell a little longer than wide, fork one with pedicel as long as the discal cell. Hind tibiae with a row of long fine pale hair.

Expanse 20 mm.

From Malay Penin: Kedah Peak, 3,000 ft., 16 March.

*Macronema albardana* sp. n. (Fig. 7.)

This is the form figured by Ulmer, Selys Monog. pl. V, fig. 30, as a form of *fastuosum*. I have both sexes and it is so differently marked from *fastuosum* (of which I have seen many specimens) that it is surely distinct. The basal two-thirds to three-fourths of fore-wing is pale, clothed with golden hair, the apical part black. The hind-wings yellowish, brown at tip. The head is yellow, unmarked except the usual silvery mark each side near eyes. Palpi brownish; legs pale, tibiae one dark, and tip of tarsi, mid-tibiae and tarsi dark at tips. Antennae with basal joints pale, then several joints brown, and beyond the joints are dark at tips. Fore-wing with pedicel of fork one shorter than discal cell.

Expanse 17 to 18.5 mm.

One (♂) from Annam, and female from Perak: Taiping Hill, Dec.

*Macronema similior* sp. n. (Fig. 1.)

I believe this is what Ulmer has figured in Selys Monograph pl. IV fig. 29 as *fenestratum*; it however is a smaller and darker species, and can be at once distinguished by the dark front tibiae. I have seen a number of specimens of *fenestratum* agreeing with the description and figure of Albarda and in both sexes the front tibiae are entirely pale, and there are various other differences in marking of the wings.

The head is yellowish with a dark spot each side near eyes with a silvery sheen, on the vertex is a dark spot each side, nearly meeting in the middle; basal joints of antennae pale, beyond are several brown joints and then pale with dark tips; palpi pale; legs pale, front tibiae and mid and hind tarsi dark, spurs pale; thoracic notum black; abdomen brown. Fore-wings nearly black, with three large costal spots, the one near middle very large, in apical area a small white spot just beyond last costal one, in the posterior part are two or three patches of white scales (but the membrane

dark as elsewhere) and two similar patches of white scales on the basal part. Hind-wings dull brown, the costal area pale to near tip. Discal cell plainly longer than broad, fork one with pedicel much longer than discal cell.

Expanse 17 mm.

From Selangor: Kuala Lumpur, and Ayer Itam, and Penin. Siam: Trang, others from the Philippine Islands, in March, April and November.

In *M. fenestratum* Albarda there are four costal spots, the extra one nearer the base. The patches of white scales may be more or less rubbed so that some specimens at first look different.

***Macronema fastuosum* Walker.**

Many from Kedah: Catchment Area near Jitra, April; Penin. Siam: Nakon Sri Tamarat, Khao Ram, Febr.; Trang, April. Widely distributed from Ceylon, India to Indo-China; the form on some of the Malay Islands known as *fasciatum* is scarcely distinct.

***Macronema fenestratum* Albarda.**

From Selangor: Kuala Lumpur. Jan., Febr., April, May, many specimens agreeing well with the description of this Sumatran species. What Ulmer has figured as this is a different species.

***Macronema dohrni* Ulmer.**

From Penin. Siam: Nakon Sri Tamarat, Khao Luang, 2,000 ft., March.

The species of *Macronema* from this general region may be separated as follows:

- 1—Vertex largely black; two large costal spots, beyond wholly dark, unmarked . . . . *dohrni*.  
Vertex pale; often some pale in apical part . . . . 2
- 2—Wing pale, a dark bar nearly across near middle, apex usually infusate . . . . *fastuosum*.  
Wing otherwise marked . . . . 3
- 3—Wing pale, with yellow hair, the apical third (or more) wholly dark . . . . *albardana*.  
Wings with various pale spots . . . . 4
- 4—But two large costal spots, but little separated . . . . 5  
Three large costal spots near together . . . . 6
- 5—No basal spot, one pale spot in apical area *distinguendum*.  
A basal spot, and two in apical area . . . . *spectabilis*.
- 6—The most basad of the three costal spots reaches along costa to base evenly . . . . *similior*.  
The most basad reaches toward base, but there is another spot along the way, either separated or connected to this costal edge; dark co'or paler than in *similior* . . . . *fenestratum*.

**Hydropsyche javanica** Ulmer.

From Pahang: Lubok Tamang, 3,500 ft., 10 March; Kedah: Catchment Area, near Jitra, 8 April. Pahang: Cameron's Highlands, 4,800 ft., June; Sungai Tahan, 29 Nov.; Selangor: Kuala Lumpur, Aug., Dec.; Pahang: Kuala Teku, Dec.; Perak: Batang Padang, Jor Camp, 1,800 ft., May; and Penin. Siam: Nakon Sri Tamarat, Khao Ram, 1 March.

**Hydromanicus taprobanes** Hagen.

From Pahang: Lubok Tamang, 3,500 ft., March; Gunong Tahan Padang, 5,500 ft., Jan.; Cameron's Highlands, 4,800 ft., March; Perak: Batang Padang, Jor Camp, 1,800 ft., June.

Described from Ceylon.

**Hydromanicus flavoguttatus** Albarda.

Several from Penin. Siam: Nakon Sri Tamarat, Khao Ram, 1,500 to 2,000 ft., Febr. and March. Known from Sumatra, Java, Borneo, and Celebes.

**Hydromanicus malayanus** sp. n. (Figs. 6, 17, 18.)

Head and pronotum black, clothed with golden hair, meso- and metanotum rufous, also with golden hair; palpi pale, with mostly yellowish hair; antennae yellowish, tips of some joints blackish; legs pale, front and mid tarsi rather darker, hind tibiae quite dark, spurs pale; abdomen mostly brownish. Fore-wings golden haired, irregularly irrorate with black, on the basal part forming large, more or less connected, mostly transverse spots, but beyond the anastomosis mostly longitudinal along the veins, but a definite band before tip. The pale areas are very much larger than those in *flavoguttatus*. Hind wings quite dark brown, uniform. Discal cell two and one-half times as long as broad, broadest before the middle; fork one has a pedicel one-half its length, fork 2 back on discal cell before middle, fork 3 opposite end discal cell, fork 4 as far back as fork 2, fork 5 not quite as far back.

Expanse 23 to 25 mm.

Kedah Peak, 3,000 ft., 16 March; Pahang: Kuala Teku. 7 Dec.; Kuala Lipis 28 March.

**Hydropsychodes opposita** sp. n. (Figs. 13, 16, 19.)

Head dark, with mostly yellowish hair both below and above; palpi brown; antennae yellowish-brown, faintly annulate; thoracic notum with yellowish hair; legs pale to brownish, tarsi darker, spurs pale. Fore-wings pale to dark brown, with several large areas of white hair; one of them at base, mostly in hind part, a large one at outer angle reaching to the cubitus and enclosing a small black spot on the hind margin at end of anal vein, a pale costal mark over the stigma and extending behind and usually uniting more or less completely with the posterior spot in the region of

the cells; at each end of the white stigmal spot is a black mark and before the basal one is a pale costal spot which is continued as a line toward the base of wing; in the apical area there are usually a few pale spots; fringe dark, with three or four patches of white at ends of the veins; hind-wings infusate, darker around fork 5, fringe dark.

Venation much as usual; fork 1 slender, but fairly long, forks 2 and 3 equal, fork 4 scarcely before 3, and fork 5 a trifle before 4. In hind wings fork 2 is back nearly one-half way on discal cell, fork 3 long pedicellate, fork 5 quite a way before base of discal cell.

Claws of front and hind-tarsi in male abnormal, that of front tarsus with two enlarged spines on side.

Expanse 13 to 15 mm.

From Selangor: Kuala Lumpur, Febr., March, April, July.

***Phylocentropus orientalis* sp. n. (Figs. 25, 27.)**

Dull yellowish; vertex with yellowish hair; antennae pale yellowish, darker towards tip; palpi brown. Thoracic notum with mostly yellow hair; abdomen dark brown above, paler beneath; legs brownish-yellow, tarsi more brown, spurs pale. Fore-wings brownish, clothed with much short yellowish hair, mixed with some black, outer fringe with black at ends of veins; hind-wings dull gray, with gray hair.

Venation of fore-wing as figured, typical of the genus; in hind-wing forks 1 and 2 are also both sessile on discal cell, fork 3 pedicellate, fork 5 not reaching as far back as discal cell.

Male genitalia small and inconspicuous, the superior appendages pale.

Expanse 19 mm.

From Pahang: Cameron's Highlands, 4,800 ft., Jan. and June; Gunong Tahan Summit, 7,186 ft., 22 Jan. The occurrence of this genus in Malaya is remarkable, as the other species are only in North America.

***Polyplectropus analis* sp. n. (Figs. 3, 4.)**

Head dark, with black hair and some yellow between antennae and on vertex; antennae pale, annulate with brown; palpi brown; legs dull brownish-yellow, spurs pale; thoracic notum with mostly dark hair; abdomen brown above, paler beneath. Fore-wings dark brown, nearly uniform, with spots of yellow hair, the entire anal region with yellow hair out to end of anal vein, the upper edge of the streak irregular, and near the end it turns up towards middle of wing, sometimes there are faint brown bars across this yellow streak. Elsewhere on the wing are groups of small spots of yellow; about one-fourth way from base is one cluster, before middle is another cluster, mostly toward

costa; several larger spots before the stigma, and one behind it; a large cluster toward the outer angle, and a few in apical area; fringe mostly dark, but with a few yellow spots. Hind-wings infusate, fringe long and dark. Venation in both wings about as in *P. javanus* as figured by Ulmer, but in fore-wing fork 4 is pedicellate, the cross-vein being at its base or just a little on the base of fork.

Expanse 17 to 20 mm.

From Pahang: Gunong Tahan Padang, 5,500 ft., Dec., Jan., and Cameron's Highlands, 4,800 ft., Jan.

Differs from *P. javanus* by larger size, genitalia, and by the long yellow streak on anal region of fore-wings. *Polycentropus nubigenus* Hagen is a *Polyplectropus*, but the wing is rather evenly spotted with yellow.

**Dipseudopsis moesta** sp. n. (Fig. 9.)

Head black in front, reddish-brown on top; antennae and palpi black; thorax black; abdomen brown to blackish, spurs dark. Wings brown, nearly uniform, vein darker, fore-wings with an oblong hyaline white mark over base of median cell and extending back to the cubitus, otherwise no marks.

Venation similar to others; fork 1 very short, fork 3 with pedicel very short, median cell quite long, its base a little before fork 5; in hind wings fork 2 is back to discal but not pointed there. Inner spur of the hind tibia not as long as the outer one, its apex with two processes, one short, stout, slightly curved and pointed, the other longer, a slender hook.

Expanse 25 mm.

From Johore: Lubok Kedondong, n.w. of Mt. Ophir, Nov.

The black antennae, palpi, and legs readily separate it.

**Dipseudopsis contorta** sp. n. (Fig. 20.)

Head black; antennae yellowish; palpi yellow-brown; pronotum yellowish; mesonotum black; metanotum brown; abdomen brown above, paler beneath; legs dull yellowish or brownish, spurs pale. Wings brown, nearly evenly colored, several pale spots; one above base of fork 1, a spot in bases of apical cells 4 and 5, and sometimes faintly in 6, an oblique spot from base of median cell back to the cubitus, and a large spot over arculus up to cubitus, a fainter spot on the costa near end of the subcosta. The inner spur of the hind tibia divided near tip into three parts, one rather broad, its tip recurved, the two others slender and curved and in most views crossed. Venation very similar to that of *D. stellatus*; pedicel of fork 3 one-half its length, fork 1 extremely short; in hind wings fork 2 goes back to cell and quite broad there.

Expanse 27 mm.

From Pahang: Kuala Tahan 21—23. Nov., and Selangor: Kuala Lumpur, 29 Jan.

The markings are extremely similar to those of *D. stellatus*, but the inner spur is quite different. The figure of Ulmer, Ann. K. K. Naturhist, Hofmus, Wien, XX, p. 96, fig. '15c, 1905, *Dipseudopsis* sp., appears to be this species, but it was not described.

***Dipseudopsis nebulosa* Albarda. (Fig. 14.)**

From Pahang: Kuala Teku, Dec.; Sungai Tembeling, Nov.; Kuala Tahan, Nov.; and Penin. Siam: Trang, 26 April, 16 May. Described from Sumatra.

***Dipseudopsis varians* Ulmer. (Fig. 12.)**

From Negri Sembilan: Kuala Pilah, 28 Dec.; Pahang: Kuala Tahan; and Penin. Siam: Trang, 16 May. Described recently from Perak.

***Dipseudopsis stellatus* McLach. (Fig. 8.)**

Several from Penin. Siam: Patalung, 1 May. Described from Southern China.

The species of *Dipseudopsis* known from this region are tabulated below:

- |   |                    |
|---|--------------------|
| 1—Pronotum black or nearly so, as dark as mesonotum ..  | 2                  |
| Pronotum pale, reddish or yellowish, paler than mesonotum .. .. .                                 | 3                  |
| 2—Antennae and legs yellowish-brown; vertex mostly dark; several pale spots in fore-wings .. .. . | <i>stellatus</i> . |
| Antennae and legs black; vertex rufous; but one pale spot in each fore-wing .. .. .               | <i>moesta</i> .    |
| 3—Head mostly blackish .. .. .  | <i>contorta</i> .  |
| Head reddish or yellowish .. .. .   | 4                  |
| 4—Male with large pale spot over three cells before middle .. .. .                                | <i>nebulosa</i> .  |
| Male with only one cell pale before the middle .. .. .  | <i>variens</i> .   |

*Esperona orientalis* Navas from Tonquin is evidently a *Dipseudopsis*, quite possibly *D. stellatus*.

***Chimarrha pedalis* sp. n. (Fig. 23.)**

Black, clothed with black hair, fully as deep black as *C. concolor*, but differs from that and all others from this region in having the front tibiae and tarsi nearly snow-white, and the mid tarsi almost white, and mid tip very pale on outer side. Wings with black hair; a hyaline white line over base of fork 2 and back to median vein, another one over cross-vein from median to cubitus, and one on arculus. Radial cross-vein much beyond middle of discal cell; fork 1 slender, back a little on discal cell; fork 2 broad, and broad at base; fork 3 scarcely longer than its pedicel; fork 5 before the arculus; radial sector before discal cell

bent upward to form the nearly smooth spot. In hind-wings fork 1 scarcely reaches discal, fork 2 a little back on discal, fork 3 very short, about equal to discal cell, fork 5 very broad and much before base of discal cell.

Expanse 14 mm.

From Kedah Peak: 3,300 ft., 10 March; Selangor: Bukit Kutu 3,500 ft., 15, April.

*Chimarrha* sp.

From Kedah Peak, 3,300 ft., 13 March, one specimen very similar to *C. concolor* Ulm., but a little smaller, and hardly as deep black.

*Tinodes* sp.

Two from Pahang: Cameron's Highlands, 4,800 ft., Jan.; both are females and are probably new.

*Psychomyia* ? sp.

Several specimens in poor condition go here or to *Psychomyiella*.

### RHYACOPHILIDAE.

*Rhyacophila* sp.

A large species (24 mm. expanse) is represented by one female from Pahang: Cameron's Highlands, 4,800 ft.; it has an unusually dark stigma, otherwise rather evenly colored; the venter has a very small tooth.

*Rhyacophila malayana* sp. n. (Fig. 2.)

Yellowish; head with some black but mostly yellowish hair on vertex, thorax with black and some yellow hair: antennae yellowish, darker towards tips; legs pale, tarsi and spurs dark; abdomen black above, pale beneath. Fore-wings yellowish-brown, clothed with some black and much yellowish hair, marmorate with brown, mostly in small spots, the larger spots along costa, often extending back as faint, narrow, irregular fasciae; a hyaline white spot, surrounded by dark, over forking of median vein; along outer margin brown and yellow alternate. Hind wings fumose, stigma dark. In fore-wings forks 1 and 2 equal, fork 3 plainly longer than its pedicel, fork 4 not longer than 3 and not as far back as fork 2, fork 5 as far back as base of discal cell. In hind-wings fork 2 is a little longer than 1, fork 3 twice as long as its pedicel. Venter of male with a very small tooth, in female a much longer process. Male appendages related to *R. curvata* Mort., but apical part of lower appendages longer, especially on top.

Expanse 16 mm.

From Penin. Siam: Nakon Sri Tamarat, Khao Ram, March; and Pahang: Gunong Tahan Padang, 5,500 ft., Dec.

***Rhyacophila cameroni* sp. n. (Fig. 10.)**

Dull yellowish, head with erect black hair, thorax also with tufts of black hair; abdomen black above, pale below; last section of lower appendages much paler than basal part; basal parts of legs pale, beyond femur darker, and hind tarsi almost black; spurs dark. Fore-wings evenly fumose, clothed with black hair, giving a generally even dark brown color, without pale spots; hind-wings also fumose, darker near costal tip. In fore-wings forks 1 and 2 are equal, fork 3 plainly shorter than its pedicel, fork 4 rather wide, not near as far back as fork 2, fork 5 fully as far back as base of discal cell. In hind-wings fork 2 longer than 1, fork 3 only about one-half of fork 2. Venter with a prominent tooth before tip.

Expanse 14 mm.

From Pahang: Cameron's Highlands, 4,800 ft., 13 Jan.

***Apsilochorema malayana* sp. n. (Fig. 21.)**

Fore-wings fumose, with a large dark stigmal mark; veins in middle and basal part with the usual erect diverging hairs, towards tip the membrane has fine hair, partly yellowish; fringe mostly black; an oblique, slender, hyaline-white streak nearly across the wing near middle; hind wings fuscous, fringe darker. Antennae and palpi dark; antennae paler on the basal joints; legs mostly dull brownish or yellowish, front tibiae with a pale mark beyond middle; spurs nearly black. Wings very similar to other species; less space between the radius and sector at middle; forking of median almost as far basad as origin of radial sector; fork 5 rather wide at base; and the forking of anal much beyond that of median; in hind-wings the upper side of fork 5 is close to the vein in front. Male genitalia very long, the superior appendages slender, parallel, and their tips sharp and bent down; the inferior piece not as broad at base as in the other species.

Expanse 12 mm.

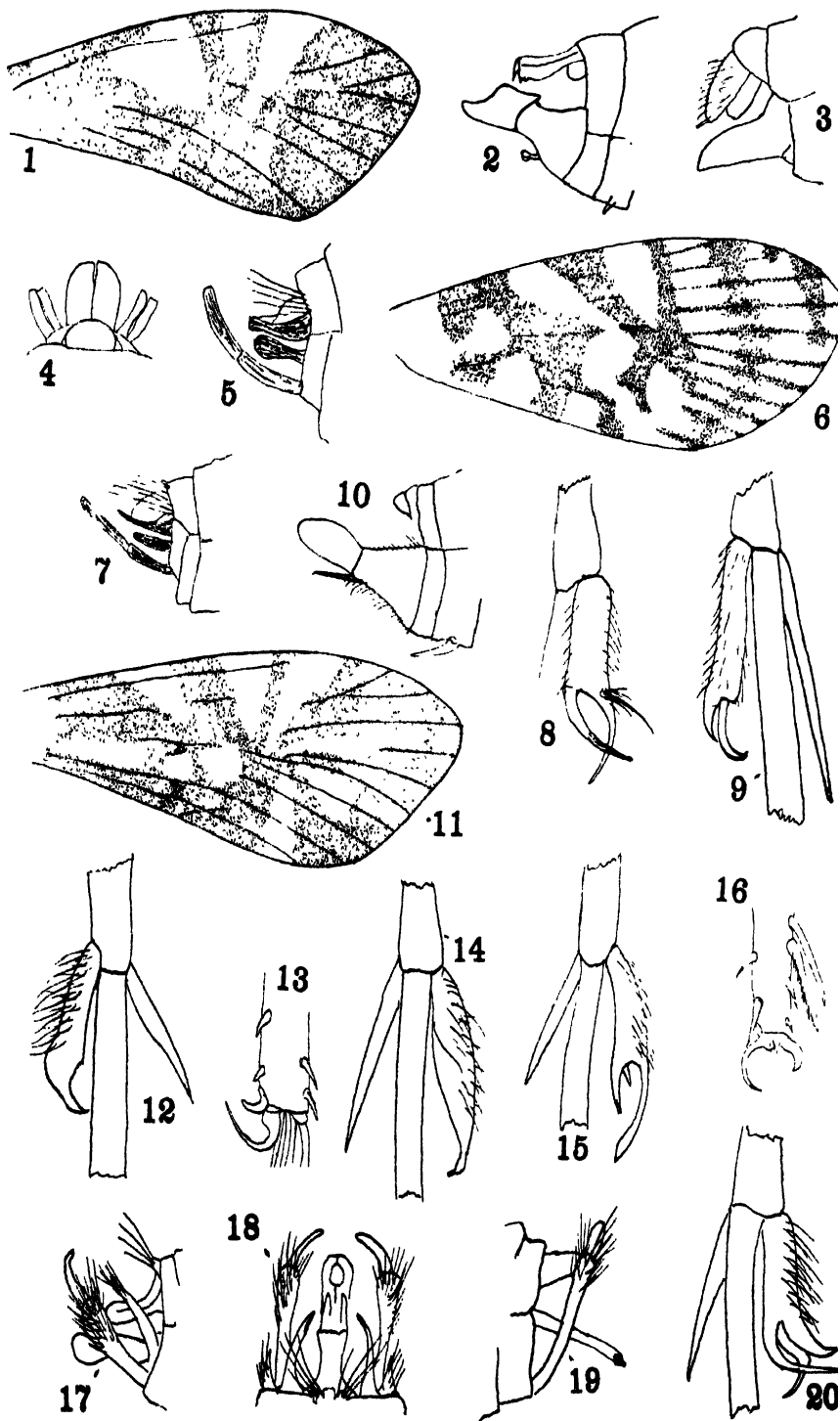
From Pahang: Gunong Tahan Padang, 5,500 ft., Nov. 30, Dec. 7, 20, Jan. 6; and Cameron's Highlands, 4,800 ft., Oct.

**Explanation of Plates.**

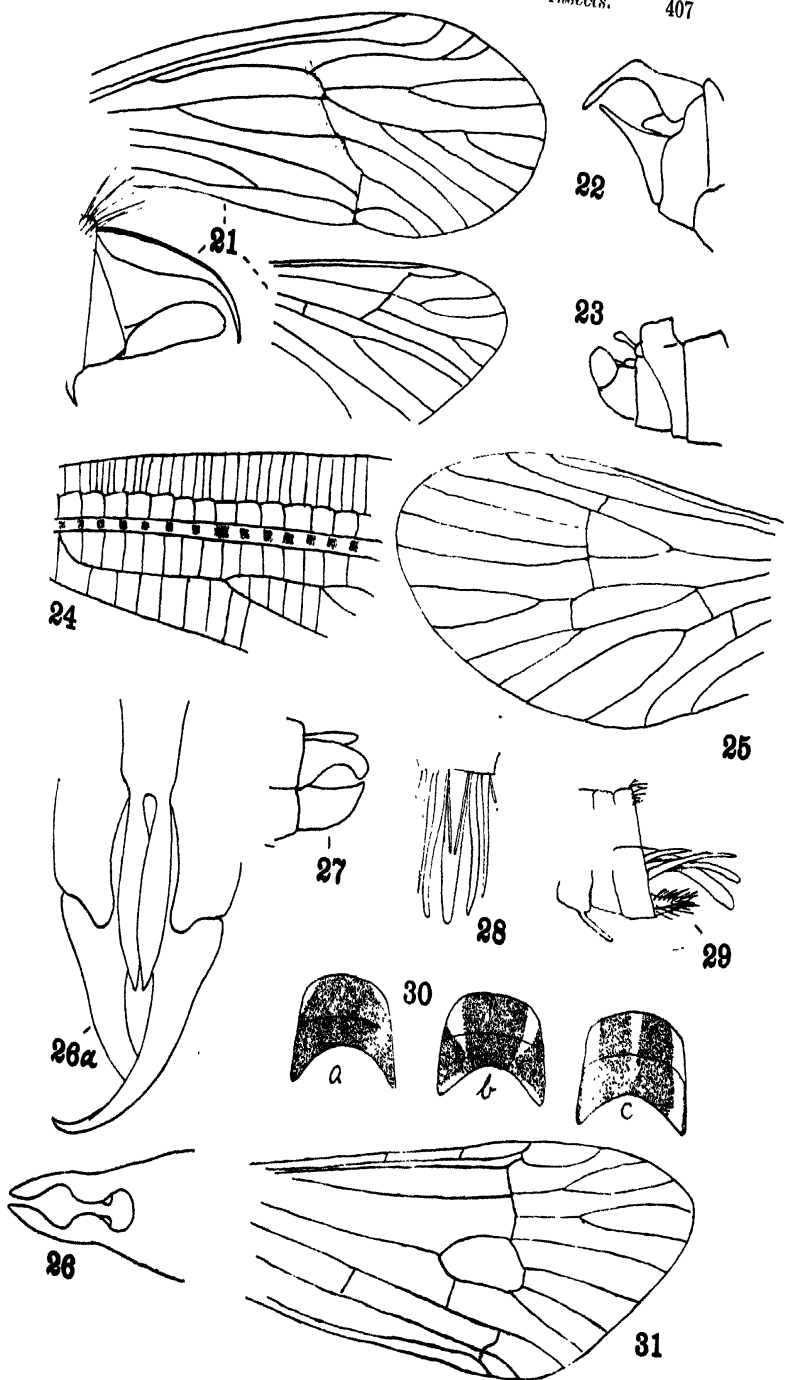
- Fig. 1. *Macronema similior*, forewing.  
" 2. *Rhyacophila malayana*, genitalia, side.  
" 3. *Polyplectropus analis*, genitalia, side.  
" 4. " " " top.  
" 5. *Macronema spectabilis*, " side.  
" 6. *Hydromanicus malayanus*, forewing.  
" 7. *Macronema albardana*, genitalia, side.



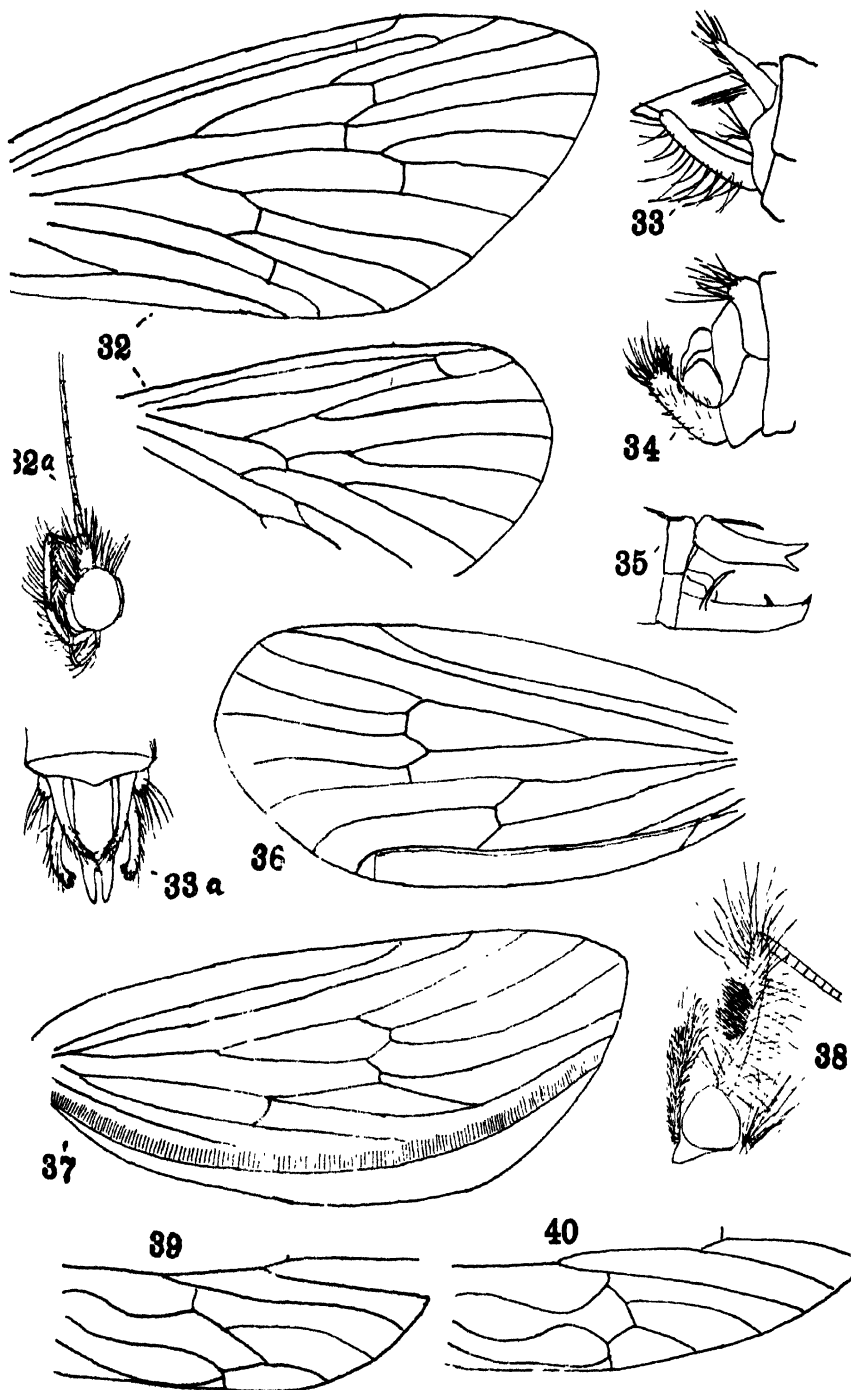
- „ 8. *Dipseudopsis stellatus*, enlarged spur.
- „ 9. „ *moesta*, enlarged spur.
- „ 10. *Rhyacophila cameroni*, genitalia, side.
- „ 11. *Macronema spectabilis*, forewing.
- „ 12. *Dipseudopsis varians*, enlarged spur.
- „ 13. *Hydropsychodes opposita*, mid-tarsus.
- „ 14. *Dipseudopsis nebulosa*, enlarged spur.
- „ 15. „ *spectabilis*, enlarged spur.
- „ 16. *Hydropsychodes opposita*, front tarsus.
- „ 17. *Hydromanicus malayanus*, genitalia, side.
- „ 18. „ „ „ above.
- „ 19. *Hydropsychodes opposita*, genitalia, side.
- „ 20. *Dipseudopsis contorta*, enlarged spur.
- „ 21. *Apsilochorema malayana*, wings and genitalia.
- „ 22. *Ganonema brunneum*, genitalia, side.
- „ 23. *Chimarrha pedalis*, genitalia, side.
- „ 24. *Phanoleon bicostatus*, costal area of wing near base.
- „ 25. *Phylocentropus orientalis*, fore-wing.
- „ 26. *Neopanorpa augustipennis*, genitalia.
- „ 26a. *Neopanorpa infuscata*, ventral appendage.
- „ 27. *Phylocentropus orientalis*, genitalia side.
- „ 28. *Goera uniformis*, genitalia, above.
- „ 29. „ „ „ side.
- „ 30. *Hagenomyia*, pronotal marks, a-*eurystictus*, b-*nicobaricus*, c-*sumatranus*.
- „ 31. *Amphipsyche minima*, fore-wing.
- „ 32. *Ganonema magnum*, wings.
- „ 32a. *Ganonema magnum*, head, side.
- „ 33. *Ganonema magnum*, genitalia, above.
- „ 33a. *Ganonema magnum*, genitalia, above.
- „ 34. *Goerinella venularis*, genitalia, side.
- „ 35. *Goerinella posticata*, genitalia, side.
- „ 36. „ *venularis*, fore-wing.
- „ 37. „ *posticata*, fore-wing.
- „ 38. „ *posticata*, head, side.
- „ 39. *Goerodes continuata*, fore-wing, anal corner.
- „ 40. „ *abrupta*, fore-wing, anal corner.













XIX.—SOME NEUROPTEROID INSECTS FROM NORTH BORNEO, PARTICULARLY FROM MT. KINABALU,  
13,455 ft.

By NATHAN BANKS.

(Figures 1-20).

The Neuropteroid insects collected in North Borneo are of particular interest because of the series obtained by Mr. H. M. Pendlebury on Mt. Kinabalu. Several of the genera were not known from any of the neighboring islands, but only from the Asiatic mainland, while a number of others are also known only from Java or Sumatra. The new Dilarid is the first taken away from the mainland, the new *Micrasema* also. *Goerinella*, *Paduniella*, *Polyplectropus* are found in Java as well as southern Asia. The *Neopanorpa* is also the first known away from South Asia, Sumatra and Java, except one is known from Formosa. One of the new Osmylids was previously known only by two species from Formosa; the two other new Osmylids were both known from one species from Java. The *Berothinae* also show relationship with the Malay Peninsula through Java.

The species from the lowlands of North Borneo obtained by Messrs. C. Boden Kloss and H. M. Pendlebury are the same or of the same genera as are common in the Philippines, and often in many parts of the Oriental Region. These forms were not in the Mt. Kinabalu collection except from low altitudes, as three thousand feet. Above that the Neuropteroids show definitely a relationship to South Asia and Java.

PERLIDÆ.

*Peltoperla concolor* sp. n.

Brownish-yellow on head and pronotum, thorax and abdomen as well as legs and setae pale yellowish. Wings slightly brownish, veins mostly pale, some near costal edge toward tip darker. Head short and broad; ocelli about three diameters apart, and as near or nearer to the eyes, latter globose; no distinct boss; pronotum broader than head and overhangs head up to eyes, almost twice as broad as long, slightly narrowed behind. Forewings long, about 15 or more costals before end of subcosta, eight or more beyond; radial sector three branched beyond anastomosis, radial sector arising almost before second third of wing, four or five divisions of median vein; the end of cubitus is three forked; five or six median cross-veins, six or seven cubital ones; setae very short.



The tip of male abdomen is turned abruptly upward showing a large concave area reaching to tip, the lateral edges greatly elevated, and on middle of segment before it is a small rounded lobe.

Expanse 30 mm.

From Mt. Kinabalu, Borneo; Kamborangah, 7,200 ft., March, April; all males. A female from Kiau, 3,000 ft., is darker on head, pronotum and wings, and the legs dark brown, except the basal part; the ocelli seem smaller and farther apart; it probably is the female of this species. A species of this genus occurs on the Philippines.

*Neoperla borneensis* Enderl.

From Kayabau 600 ft., near Mt. Kinabalu, 8 May and Mt. Kinabalu, Kiau, 3,000 ft., 31 March.

*Nemoura* sp.

Specimens in poor condition from Mt. Kinabalu, Kamborangah, 7,200 ft., March.

#### SIALIDÆ.

*Neuromus testaceus* Rambur

From Mt. Kinabalu, Kiau, 3,000 ft., 9 April; widely spread in the Malaysian subregion.

*Protohermes dichrous* Brauer

From Mt. Kinabalu, Kiau, 3,000 ft., 13 April. Already known from Borneo, also in Java.

*Protohermes uniformis* sp. n. (figs. 19, 20.)

Pale yellowish, tips of mandibles and tips of palpi black; antennæ dark beyond basal part; a black line each side on back of head and a similar line on each side of the pronotum, mesonotum dark in middle of joint; legs pale, tarsi darker; abdomen brown. Wings pale, very faintly fumose, with scattered whitish patches, mostly before middle; veins in these places yellowish, elsewhere veins darker; hind wings pale, unmarked, veins pale.

Fore-wings with 28 to 30 costals; six or seven cross-veins between radius and radial sector; branches of median vein normal; anal cell fully twice as long as broad; in hind wings upper branch of median runs into radial sector without cross-vein back to median. Superior male appendages very broad, even to the tips, lower appendages scarcely connected on basal part.

Length fore-wing 36 mm., width 12 mm. ♂.

From Mt. Kinabalu, Lumu Lumu 5,500 ft., April.

*Protohermes bellulus* sp. n. (fig. 18.)

Pale yellowish; tips of mandibles and antennæ beyond second joint black; two spots on back of head, two

elongate spots on each side of the pronotum, black; sometimes a faint spot each side on mesonotum dark; abdomen brown; legs pale yellowish, tarsi more brown. Wings whitish hyaline, with some faint darker clouds, some more distinct ones tend to form a band across wing at basal third, before and beyond being pale areas; stigma slightly darkened; veins yellowish in pale places and dark elsewhere, the costals nearly all black. Hind wings pale, the veins mostly pale, but a few are dark, and some of the costals near middle are dark.

In fore-wing about 28 to 32 costals; six to eight cross-veins between radius and radial sector; the cubitus forks a little beyond cross-vein to median; lower branch of median forks once, upper branch forks and each forks again (as usual) anal cell fully twice as long as broad.

In hind wings the upper branch of the median runs sinuously into the radial sector, without any cross-vein back to median.

Superior male appendages have a long slender tip; the inferior appendages rather broadly connected on basal part.

Length fore-wing 32 (♂) to 40 (♀) mm.

Breadth fore-wing 11 (♂) to 13 (♀) mm.

From Borneo; Mt. Kinabalu, Lumu Lumu, 5,500 ft., April; Kiau, 3,000 ft., April; and Lobang, 4,000 ft., April.

#### DILARIDÆ.

##### *Rexavius grandis* sp. n.

♂ Yellowish; head unmarked, pronotum with a dark spot in front and one each side (often faint), thoracic notum slightly marked with dark; abdomen pale; antennæ brownish-yellow, the branches rather darker; legs pale, densely clothed with yellow hair. Fore-wings of the usual faint reddish or purplish hue; veins partly dark, partly pale, subcosta and radius with short dark marks, gradates black, faint clouds around them and often over forkings of veins or other cross-veins, all veins with mostly erect, long, and mostly black hair, but in pale areas with yellowish hair, costa with much yellow hair toward tip; hind-wings with almost all veins pale, forkings and some cross-veins dark, costal tip rather more yellowish, hind fringe toward base very long.

Structure very similar to *R. nietneri*; three bristle-bearing tubercles on vertex; the antennæ with about thirty branches, many of those on basal part as long as front tarsi; pronotum with two transverse tubercles near front, and one each side behind. Fore-wings large and broad; several costals forked; about seven to twelve cross-veins

between subcosta and radius; second radial sector forked six times, about ten cross-veins back to radius; four cross-veins to first radial sector; four to five between medius and first radial sector, two between forks of medius, two from medius to cubitus, two or three between forks of cubitus, one (near base) from cubitus to first anal; first radial sector forks at outer gradates; lower branch of cubitus forks three or four times. Hind-wing with radial sector forked six times; one series of about six gradates.

Length of fore-wing 11 to 16 mm.

Breadth of fore-wing 4.75 to 6 mm.

Several males from Borneo; Mt. Kinabalu, Kamborangah, 7,200 ft., March and April.

#### CHRYSOPIDÆ.

##### *Chrysopa splendida* Weele.

From Kudat, 10 Sept. Also occurs in Philippines, Java, Malay Peninsula.

##### *Chrysopa bakeri* Bks.

From Samawang, July; Kudat, Sept., and Bettotan, Aug. Described from Borneo.

##### *Chrysopa rizali* Bks.

From Samawang, July. Known from several parts of the Malaysian subregion.

##### *Chrysopa caliptera* Bks.

From Samawang, July, described from Borneo.

##### *Chrysopa atrioris* Bks.

From Bettotan, August, and Kudat, Sept. Described from Singapore, known from the Philippines.

##### *Chrysopa nigribasis* Bks.

From Samawang, July. Known from several places in the Malaysian subregion.

##### *Chrysopa alticola* sp. n.

Pale yellowish, head and palpi unmarked, basal joint of antennae usually with some red on outside; pronotum sometimes shows a red spot each side in front; legs and body otherwise unmarked. Wings hyaline, with yellowish veins, cross-veins more or less dark, costals at ends, first radial entirely, others in part dark, basal cubital cross-veins entirely, and both series of gradates dark, the outer ones sometimes only faintly dark, and always the origin of radial sector with the cross-vein back to third cubital cell, and the fork of first anal near end both black and almost margined with dark; in hind wings the veins pale. Antennæ very long; pronotum as broad as long, narrowed in front. In fore-wing six inner and usually ten outer

gradates in sub-parallel series, the outer row scarcely nearer to outer margin than to inner series; before the base of inner series are three or four cross-veins between the basal branches of radial sector (those that run into the medius); about 26 costal cross-veins, those near basal third oblique; outer marginal forks long; in hind wing six to eight gradates in subparallel series, and before base of inner row are several others as in the fore-wing.

Length of fore-wing 15 to 16 mm.; breadth of fore-wing 5.5 to 6 mm.

From Mt. Kinabalu, Kamborangah, 7,200 ft., March and April, and Lumu Lumu, 5,500 ft.

By the cross-veins before the inner series of gradates it is related to *C. javanica* Petersen, but differs from that in the red on basal joint of antennae, in the more narrow costal cells, and the much longer outer marginal forks, the black forked veins near base, and the inner gradates as dark or darker than the outer series.

***Chrysopa ilota* Bks.**

From Kudat, Sept., and Sandakan, July. Described from the Philippines.

***Chrysopa obliquata* Bks.**

From Kinabalu, Marei Parei, 5,000 ft., April; and Lumu Lumu, 5,500 ft., April; described from the Philippines.

***Chrysopa flaveola* Schneider.**

From Bettotan, July. Known from various places in the Malaysian subregion.

***Chrysopa eurycista* Navas.**

From Kudat, Sept., and Bettotan, Aug., widely spread in the Malaysian subregion.

***Nothochrysa ferruginea* McLach.**

From Kudat, Sept. Known from other parts of Borneo.

***Ankylopteryx nervosa* Navas.**

From Bettotan, July, Kudat, Sept. Known from the Philippines.

***Ankylopteryx nonelli* Navas.**

From Bettotan, 13 Aug. Known from Borneo and Philippines.

***Sencera anomala* Brauer.**

From Bettotan, July, Aug. Widely spread in the Malaysian subregion.

#### HEMEROBIIDÆ.

##### *Berothiinae*.

***Acroberotha nicobarica* Navas.**

One from Bettotan, 17 Aug. Widely spread in Malaysian subregion.

**Berotha borneensis Navas.**

From Bettotan, 16 Aug.

**Berotha piepersi Weele.**

From Kudat, 5 Sept.; known from Java, Sumatra and the Malay Peninsula.

**Hemerobiinæ.****Notiobiella minima Bks.**

From Bettotan, 27 July.

**Notiobiella valida Bks.**

From Bettotan, 17 Aug.

**MANTISPIDÆ.****Mantispa newmani Bks.**

From N. Borneo; Bettotan, July and August. Described from Borneo.

**Eumantispa fuscata Navas.**

Mt. Kinabalu, Kamborangah, 7,200 ft., 18 April. Described from Celebes.

**OSMYLIDÆ.**

Four species of Osmylids were taken, belonging to four genera as they are now classified, but many of the genera of this family are hardly of subgeneric value, and a conservative classification is badly needed. The four forms may be tabulated as below.

1. Between median and cubitus several cross-veins are absent beyond the first, leaving a break in the series  
.....2.

Between median and cubitus no cross-veins skipped, in fairly even series; wings fairly broad; with black near middle of each wing, 12 to 15 cubital cross-veins; five or more series of gradates.....*Thaumatosmylus*.

2. Cross-vein between radial sector and median is out on first branch of radial sector; ten or twelve cubital cross-veins; five or more gradate series; subcosta and radius with some black streaks in pairs; a swollen black-veined spot on hind margin of fore-wings.....*Spilosmylus*.

The first cross-vein between radial sector and median is before the forking of radial sector; no paired streaks on subcosta and radius.....3.

3. Wings elongate; about 10 or 12 cubital cross-veins; five or more gradate series; first anal runs out as far as second cross-vein from cubitus to median.....*Heliosmylus*.

Wings broad; about four or five cubital cross-veins, about four series of gradates; first anal short, runs out before second cross-vein from median to cubitus.....*Stigmatosmylus*.

***Spilosmylus modestus* Gerst.**

From N. Borneo; Bettotan, 15 Aug., and Mt. Kinabalu, Kenokok, 3,300 ft., and Lumu Lumu, 5,500 ft., April. Occurs also in the Philippines and Java.

***Heliosmylus fraternus* sp. n.**

In general this species is similar to *H. krugeri* as figured by Petersen. Face mostly pale, darker on sides and below, dark spot above antennæ, the antennæ dark, but basal joint more or less pale; legs pale, tarsi sometimes darker; abdomen brown; thorax mostly brown, pronotum rather broader than long, pale, with broad lateral and a narrow median strip black. Fore-wings with brown or black veins, slightly interrupted with pale, more on costals than elsewhere, subcosta scarcely at all marked, radius brown at ends of cross-veins, between radius and subcosta a few small brown spots. Wing heavily marked with brown spots, those in costal area mostly oblique; all long outer and hind margin is a long brown streak a little removed from the margin, but with numerous connections to it; heavy brown marks over outer gradates and between them and the series before; along cubitus are three groups of dark brown spots; elsewhere many smaller brown spots, often transverse, and sometimes tending to form transverse bands, but not as plainly so as in *H. krugeri*; the stigma is a yellow spot, with a brown spot at each side. In hind wings the veins are mostly brown, a few faint clouds between subcosta and radius, outer and hind margin distinctly clouded, outer gradates margined with brown, also the outer cross-veins between branches of median. Wings elongate, in fore-wings between cubitus and median one or two veins lacking beyond the first (often some dark marks across the cell); the first cross-vein between radial sector and median is before forking of radial sector; five or six rows of gradates, but before them many irregular cross-veins; about twelve to fourteen cross-veins between forks of cubitus; about fifteen radial cross-veins; and about fifteen branches of radial sector. In hind wings the cubitus extends out to about middle of wing.

Length of fore-wing 21 mm.; width 6 mm.

From Borneo; Mt. Kinabalu, Kamborangah, 7,200 ft., and Lumu Lumu, 5,500 ft., April.

***Stigmatosmylus pretiosus* sp. n.**

Head pale; face with two black spots on clypeus, one each side above mandibles, and one each side under antennæ tending to form an angulate band; vertex with a broad black spot with a median extension in front; tips of palpi dark; basal three joints of antennæ mostly dark, beyond very pale; pronotum largely dark, pale marks in middle and sometimes on sides; thorax mostly pale, much spotted

above with dark, the meso-scutellum yellow; abdomen dark, some pale spots near base; legs pale, tips of tarsi dark. Wings mostly hyaline; venation pale, with dark dots and streaks; subcosta almost wholly pale, radius with scattered dark dots, between are three dark spots, even the gradates not wholly dark; fore-wing more or less heavily spotted with dark brown (sometimes in teneral specimens the spots are very faint); a large one at stigma, another on upper end of penultimate gradate series, a large one at base, two or three smaller spots between radius and radial sector, two on cubitus and two on hind margin, these latter before middle of wing, elsewhere a few small spots, but apical third free, also the costal field, but a few spots along costal edge. In hind wings the veins mostly pale, but dark near stigma and a few dark dots on the radius, a prominent dark stigma, and sometimes a few gradates dark. In forewings a vacancy between first and next cross-vein between medius and cubitus; the cross-vein between radial sector and median is about its length before forking of radial sector; only about four cross-veins between branches of cubitus; about eight or ten between radius and radial sector; about nine branches of radial sector; about four series of gradate veinlets, the outer row far apart. In hind-wings the cubitus does not extend out to middle of wing.

Length of fore-wing 16 to 18 mm.; width of fore-wing 6.5 to 7 mm.

From Borneo; Mt. Kinabalu, Kamborangah, 7,200 ft., and Lumu Lumu, 5,500 ft., April.

*Thaumatomyzus delicatus* sp. n.

Head pale; face unmarked; vertex with a dark spot or lines; second joint of antennæ dark, and often a mark on outer side of first joint, rest very pale; palpi and legs pale; pronotum pale, dark marginal stripes; pleura pale, thoracic notum mostly black (except pale in teneral specimens); abdomen brown. Wings very delicate, largely hyaline, often (teneral) but little marked; a spot beyond stigma, several clouds in costal area, two rather large smaller spots along the cubitus, on outer gradates and faintly elsewhere; hind-wings with spot beyond the stigma, several along subcosta and on gradates, one or two large ones in basal posterior part. In well-colored specimens these marks are dark brown; fore-wing usually with six large spots, three in costal area (often extending over radius), one beyond stigma, one on certain outer gradates, and one near end of the cubitus; several other smaller spots, some near base. In hind-wings a spot beyond stigma, one on outer gradates and two on basal part, smaller ones near end of cubitus. Pronotum a little longer than

broad, narrowed in front. Fore-wings broad; very densely veined, cells in basal part rarely longer than broad; no veins missing between median and cubitus (except in one or two specimens); first cross-vein between median and radial sector before forking of radial sector; about seventeen cross-veins between cubital forks, about seventeen between radius and radial sector; eleven branches to radial sector; five series of gradates and before them irregular; in hind-wings the cubitus runs out much beyond middle of wing. In both wings a corneous black dot in middle of a cell before middle of length and before middle of width. Venation of fore-wing almost wholly pale, but dark on dark spaces, subcosta and radius also pale, between them is a number of dark spots; in hind wing venation almost wholly pale.

Length of fore-wing 15 to 19 mm.; width of fore-wing 7 to 8 mm.

Over thirty specimens from Mt. Kinabalu, Kamborangan-gah, 7,200 ft.; and Lumu Lumu, 5,500 ft., April and last days of March.

#### MYRMELEONIDÆ.

*Neuroleon disjunctus* Bks.

From Jesselton, March; known from the Philippines.

*Distoleon dirus* Walk.

From Mt. Kinabalu, Kiau, 3,000 ft., April. All over the Malaysian subregion.

*Hagenomyia nicobaricus* Brauer.

From N. Borneo; Bettotan, 9 Aug. Widely spread in the Malaysian subregion.

*Myrmeleon celebensis* McLach.

From Kudat, N. Borneo, 9 Sept. Common on all the neighboring islands.

#### PANORPIDÆ.

*Neopanorpa flavicauda* sp. n. (figs. 6, 8.)

Black; basal joint of antennæ pale, and a pale streak each side of beak below eyes; last three segments of the abdomen pale yellowish; legs yellow brown. Wings clear, with almost black marks, these similar to *N. formosana* or heavily marked *N. appendiculata*, but the apical band has no pale spot behind, and the posterior side of the fork of the stigmal band is broad like the anterior side, and the sub-basal band is more oblique, especially behind; the hind wings are marked in the same way. The venation is like that of *N. appendiculata*. In the male the tip of third segment has a median triangular process longer than in *N. appendiculata*, about half way across fourth segment; sixth segment cylindric and plainly longer than fifth; seventh



and eighth shorter than sixth, the seventh longer than the eighth. Male claspers contracted at base, and with a large lobe near inner base.

Expanse 28 mm.

From Mt. Kinabalu, Kenokok, 3,300 ft., April.

### TRICHOPTERA.

#### SERICOSTOMATIDÆ.

*Goerinella grandis* sp. n. (figs. 1, 3, 4, 9.)

♂ Mostly pale brown, basal joint of antennæ darker; palpi, legs, and venter of abdomen pale yellowish, tip of abdomen nearly black. Fore-wings clothed with small scale-like hairs, largely yellow, and more scattered erect hairs, often yellow, but sometimes black, and especially dense and long toward base of wing; two hyaline white spots, one at connection between fork two and medius, other at forking of medius. Hind-wings with fine short gray hair, fringe toward posterior base very long. Structure similar to others of genus; the male palpi recurved, very slender, and with a large tuft of hair at tip; basal joint of antennæ very long, curved, thickened toward tip, behind on basal part with a long curved spine or spur; the hair brown, particularly dense in part of front. Venation of fore-wing similar to *G. piscina*, but costal area not so broad, the apical part of wing, and consequently the apical cells longer. Venation of hind-wing also resembles *G. piscina*, but costal area is much narrower, and space between discal cell and median vein is wider. In a female (from same locality and date) the color is same as male; the basal joint of antennæ long and straight, rather longer than breadth of the head; the venation is practically that of a *Goerodes*, but the front part above radial sector is not so broad.

Expanse 28 mm.

From Mt. Kinabalu, Pakka, 10,200 ft., 23 March.

*Micrasema borneensis* sp. n. (fig. 13.)

Dark brown, head and basal joint of antennæ densely clothed with almost black hair, antennæ beyond very pale and gradually becoming dark; abdomen dark, with circles of long hairs; legs brown, hind pairs paler. Wings brown, uniform, outer fringe nearly black. Venation of male almost exactly like *longulum*, in hind wings fork 1 is not quite as long; in female similar to *longulum* but fork 2 is distinct and long in hind wings, in fore wings fork 3 reaches almost back as far as discal cell, scarcely pedicellate, and fork 4 reaches back a little farther than fork 3, and there is a cross-vein from fork 5 to anal vein. Spurs 2, 2, 2.

Expanse 17 mm.

From Mt. Kinabalu, Pakka, 10,200 ft., 20-25 March.

#### LEPTOCERIDÆ.

##### Genus *Allosetodes* gen. nov.

A Leptocerid; spurs 1, 2, 2, legs slender; basal joint of antenna long and large. Wings slender, acute at tips, with very long fringes venation reduced in the median area; a large, long discal cell, fork 1 pedicellate; fork 2 from lower apex of discal cell, rather wide at base. Behind this the median vein simple, almost a branch from the discal cell, but extended a little basally where it runs out; the cubitus has a short fork 5, and behind three anals. Hind wings with two forks, fork 1 is fairly long, and other fork is much longer and behind the first, and then three anals.

##### *Allosetodes plutonis* sp. n. (figs. 5, 7, 14.)

♂ Black; antennæ, palpi, and legs brown; fore-wings black, but with several large brown spots, two along the costa, reaching backward some distance, several in the apical parts of the apical cells, and one at the base of wing behind; these brown spots in the proper light show golden reflections; outer fringe largely brown, but with several black patches, one of them particularly prominent is at the extreme tip. Hind wings black, with long black fringe.

Expanse 12 mm.

From Mt. Kinabalu, Pakka, 10,200 ft., 25 March.

##### *Notanatolica gilolensis* McLach.

From N. Borneo; Bettotan, 17 Aug. Widely spread in the Malaysian subregion.

#### HYDROPSYCHIDÆ.

##### *Macronema splendens* sp. n. (fig. 2.)

♂ Head yellow, dark each side of face near eyes with a silvery sheen; palpi yellowish; antennæ yellow on basal joint, several joints beyond dark brown, but farther out the joints are pale with dark tips; legs yellowish, front tibiæ dark on outer side, mid tibiæ dark at tips and on tips of tarsi, spurs pale; thoracic notum black; abdomen brown. Fore-wings dark brown, with large yellowish marks occupying about half of surface, all pale in the membrane: three large costal spots, not far apart, the outer one extending back to a rounded spot, in upper apical area a smooth pale spot beyond cell, in lower outer part two broad curved pale marks, on the hind margin a large, nearly square, mark, and before it a long pale streak to near base where it is deep black, in the anterior basal part a curved pale streak. Hind-wings

brownish, apex darker, costal area to near tip broadly hyaline. Fork one in fore-wings with a pedicel about equal to discal cell. Hind tibiae of male with fine white hair behind.

Expanse 19 mm.

Seven specimens from Bettotan near Sandakan, North Borneo, in July. In general similar to the Chinese *M. hospitum* as figured by Knight in the Seys Monog. plate IV, fig. 29, but the basal and posterior spots are different.

***Macronema distinguendum* Ulmer.**

From N. Borneo; Bettotan, 28 July; and Mt. Kinabalu, Lumu Lumu, 5,500 ft., 13 April.

***Macronema pallipes* sp. n.**

♀ Pale yellowish throughout; a silvery white spot in front of each eye; the antennæ, beyond basal joint, dark on the upper side. Wings clothed with short appressed yellow hair, no median band, nor dark on tip; legs wholly pale. In general very similar to *M. fasciata*; the wing is longer in apical part than in *fasciata*, the 2nd, 3rd, 4th, and 5th apical cells longer than width of wing at anastomosis. The discal and median cells also rather longer than in *fasciata*.

Front wing long 14 mm., wide 4.5 mm.

From Mt. Kinabalu, Marei Parei, 5,000 ft., April.

Differs at once from *M. fastuosum* and *M. fasciata* in having pale tibiae and tarsi, thus agreeing with *M. 5-punctata* of the Philippines, but it lacks the spots. The yellow of fore-wing is not as deep or as near orange as in most of *M. fastuosum*.

***Hydropsyche isolata* sp. n. (fig. 11.)**

♂ Head with mostly yellowish hair, a tuft of brown each side on vertex; thorax with yellowish hair; antennæ pale, obliquely annulate with brown; palpi pale brown; legs yellowish, spurs a little darker; abdomen brown above, pale beneath. Fore-wings yellowish, densely and evenly marked with many small brown spots, in apical part tending to form wavy bands, no larger spots, outer fringe dark, interrupted with pale; hind-wings yellowish-gray with darker gray fringe. In fore-wings the venation very similar to *H. pellucidula*, but the discal cell is larger, about as broad and three-fourths the length of the median cell, and the fork 5 extends back as far as fork 4. In the hind-wings also similar to *pellucidula*, but the cross-vein between branches of medius out farther than the last, the fork 3 rather shorter, and cubitus at base of fork 5 runs very close to median vein,

Expanse 18 mm.

From Mt. Kinabalu, Kiau, 3,000 ft., 23 March.

***Hydromanicus formosus* sp. n.**

♂ Black; head and thorax with golden yellow hair; palpi pale; antennæ and legs dull yellowish, the femora brown, spurs pale. Fore-wings rich dark brown, with many scattered spots of golden yellow; six along the costal margin, two of them before middle rather large; five large ones in anal part, one at base, one on the cubitus and three along the margin, the middle one the longest, the last extending up over base of fork 5. Along outer margin is a rather small spot in each cell; similar small ones in the area above median vein to near base, other areas with small ones, two in the discal cell, several larger ones in apical part of wing, some of them tend to form a band. Hind-wings dark gray, veins and fringe darker. In fore-wings discal cell is about two and a half times longer than broad; fork 1 with pedicel about equal to width of discal cell; fork 2 back about one-half way on discal cell; fork 3 as far back as fork 2; fork 4 back as far as fork 5; all apical cells long and narrow. Cross-vein from cubitus to first anal vein obliquely backward, and before forking of median vein; cross-vein from lower median to the cubitus is before base of discal cell; between forks 3 and 4 the cross-vein is out some distance on fork 3. In hind-wings fork 1 is very short, fork 2 reaches the cross-vein behind, fork 3 short pedicellate.

Expanse 25 mm.

From Mt. Kinabalu, Marei Parei, 5,000 ft., 27 April. The most handsome species of the genus.

***Sciops elongatus* sp. n. (fig. 10.)**

Brown; head and thorax with dark brown hair; antennæ yellowish, scarcely annulate, rather strongly crenulate; palpi brown; legs yellowish, spurs more brown; abdomen dark brown. Fore-wings brown, uniform, no spots, except a hyaline white line at forking of the median vein and along the upper branch. Fore-wings long as in *Hydromanicus*, but discal cells long, and subcosta and radius of hind-wing end as in *Sciops*. In fore-wings the discal cell is over five times as long as broad, in hind-wings fully six times as long as broad. In forewings fork 1 has a rather short pedicel, fork 2 extending back on discal cell about width, fork 3 long pedicellate, fork 4 very long, as far back as fork 5; the cross-vein from discal cell to radius not its length from end of discal cell, the cross-vein from discal cell to medius a little before fork 2, and the next a little beyond the latter. Venation of the hind-wings similar to that of *S. marginatus*, but fork 5 is wider.

Expanse 18 mm.

From Mt. Kinabalu, Kamborangah, 7,200 ft., Marei Parei, 5,000 ft., and Lumu Lumu, 5,500 ft., last of March and early April.

**Sciops oculata** sp. n. (fig. 17.)

♂ Head brown, with brown hair; eyes very large, at vertex separated by scarcely more than the width of a basal antennal joint; palpi brownish; antennæ pale, faintly annulate, distinctly crenulate; legs yellowish, spurs rather darker, front femora above dark; abdomen dark at tip, pale on base; thorax black with mostly black hair. Fore-wings pale, mostly clothed with fine whitish hair, a large dark spot at stigma, a couple on costa before this, one over end of anal vein, distinct dark irrorations in apical area, and fainter ones elsewhere. In hind wings pale gray. Fore-wings elongate, but discal cell long and radius and subcosta of hind-wings as in *Sciops*; discal cells in both wings over four times as long as broad. In fore-wing fork 1 with pedicel one-half its length, fork 2 reaching back its width on discal cell; fork 3 but little longer than its pedicel; fork 4 as long as fork 5; cross-vein between branches of median is opposite base of fork 2; cross-vein from discal cell to median vein is its length before fork 2. Venation of hind wing as in *S. marginatus*, but fork 5 is broader.

Expanse 17 mm.

From Mt. Kinabalu, Marei Parei, 5,000 ft., 28 April.

Known by its pale color, and large eyes; by its elongate wings related to *S. elongatus*.

**Sciops pallidus** sp. n. (fig. 13.)

Head and thorax yellow, clothed with yellow hair; antennæ, palpi, and legs pale yellowish; abdomen brown. Fore-wings and hind wings pale brownish-yellow, clothed with pale hair, no markings, fringe dark gray. Wings moderately short, but not as broad as in *S. fasciatus*; discal cell in fore-wing over four times as long as broad, in hind wings about six times as long as broad; fork 1 hardly longer than pedicel, fork 2 scarcely back on discal cell, fork 3 with pedicel nearly its own length, and fork 4 not as far back as fork 5; cross-vein from discal cell to medius over its length from fork 2, cross-vein from medius to cubitus is just before medius forks, cross-vein between branches of medius out its length on fork 4. In hind wing from where the subcostal bends up the radius practically unites with the radial sector till the radius itself bends up to costa; fork 1 and fork 3 both very short, fork 2 scarcely back on discal cell, fork 5 broad, fully as broad near base as at tip.

Expanse 12 mm.

From North Borneo, Bettotan, 24 July. Distinct by uniform pale color of wings and the yellow head.

**Sciops fasciatus** Ulmer

From North Borneo, Bettotan; 23 August, common in the Philippines.

**Polyplectropus irroratus** sp. n. (fig. 16.)

♂ Head with dense long dark brown hair, some golden between and just above antennæ; palpi brown; antennæ pale, strongly annulate with brown; thorax with brown and golden hair; legs brown, femora more yellowish, spurs brown; fore-wings brown, densely irrorate with golden yellow spots; in anal area in regular bands, elsewhere more or less in bands, fairly large brown spot before and beyond stigma, the yellow costal spots on basal part of wing are far apart; fringe black, outer part interrupted with yellow; hind-wings gray brown, with a darker fringe. In fore-wings discal long, but not equal to fork 2; fork 1 much shorter than pedicel, fork 3 also shorter than pedicel, fork 4 only a little before fork 3, fork 5 very large (as usual); venation of hind-wing like that of *P. javanicus*.

Expanse 13 mm.

From Mt. Kinabalu, Kiau, 3,000 ft., 1—3 April. Distinct by heavily spotted wing and male genitalia.

**Polyplectropus unicolor** sp. n. (fig. 12.)

Head and pronotum with dense dark brown hair; palpi pale brown; antennæ pale, broadly annulate with brown; legs yellow brown, spurs rather paler; fore-wings nearly black, uniform, a faint hyaline white mark at end of anal vein, and on forking of median to cubitus; hind-wing gray, upper apical part darker. In fore-wings the discal cell is long, almost as long as the second apical cell; fork 1 about equal to pedicel, fork 3 not further back, and fork 4 only a little before fork 3, fork 5 very long (as usual). Venation of hind-wings as in *P. javanicus*. Ventral plate of female emarginate in middle.

Expanse 17 mm.

From Mt. Kinabalu, Kamborangah, 7,200 ft., March. Differs from all others of the genus in uniform dark wings.

**Chimarrha atripennis** sp. n.

Deep black, with black hair on head and thorax, front tibiae and tarsi pale. Wings black, fore-wing with three hyaline white spots, one up from end of anal vein, one from base of fork 2 to median vein, and one before this connecting the branches of median vein. Wings rather long and slender, discal cell pointed at base, over three times as long as broad; the radial sector before the cell is not bent upward, but curves downward much as in *C. concolor*, the upper branch of radial sector at base of discal cell is not thickened; apical cells long and narrow; cross-vein from discal cell fully

its length before fork 1. In hind wings the discal cell is also very long, fork 1 is pointed at base at tip of discal cell, fork 3 fairly long and slender.

Expanse 13 mm.

From Mt. Kinabalu, Marei Parei, 5,000 ft., and Kiau, 3,000 ft., both April. By pale tibia and tarsus of front leg related to *C. pedalis*, but venation somewhat different.

#### HYDROPTILIDÆ.

##### *Paduniella borneensis* sp. n.

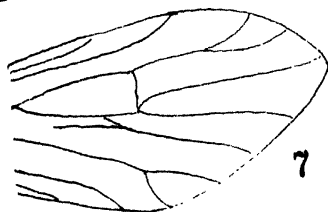
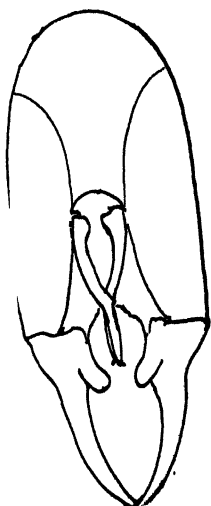
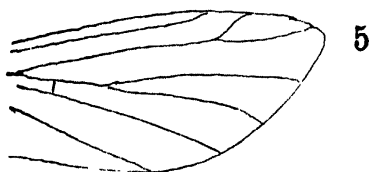
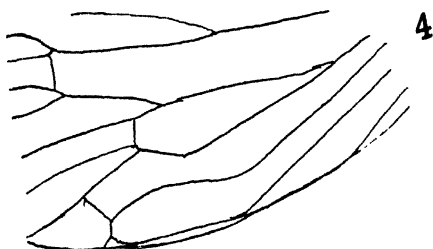
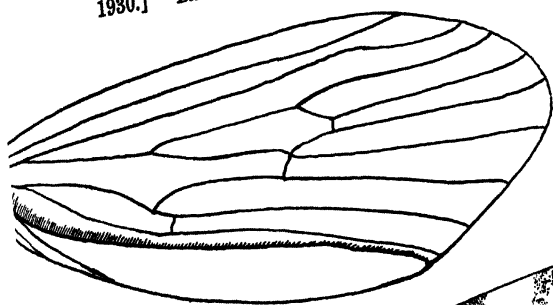
♀ Palpi brown; antennæ pale on basal third and narrowly annulate with brown, beyond becoming dark brown; head with brown hair in front, above with mostly gray hair; legs yellowish-brown; abdomen nearly black above, last segment yellowish, truncate. Fore-wings gray, with gray and much yellowish hair, nearly uniform color throughout, fringe on outer front margin nearly black, posterior fringe gray, but with some yellow patches near outer angle; fringe of hind wings gray, very long. In fore-wing the venation is much as in *P. semarangensis*, but fork 5 has upper side shorter, and discal cell rather shorter; in hind wing venation practically same as the Javan species, but the hind wing is not as acuminate at tip, the outer posterior margin not or scarcely concave.

Expanse 8 mm.

From Mt. Kinabalu, Kiau, 3,000 ft., April.

#### Explanation of Figures.

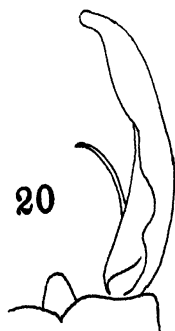
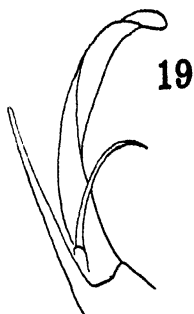
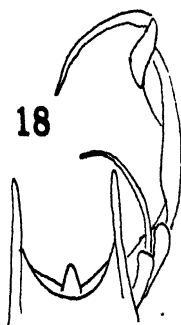
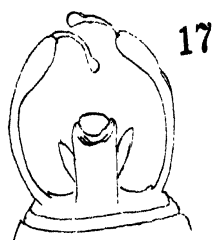
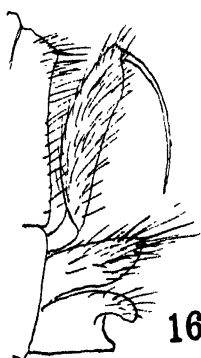
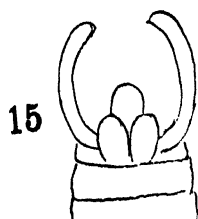
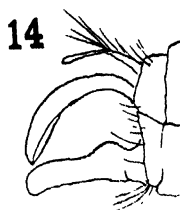
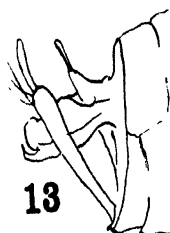
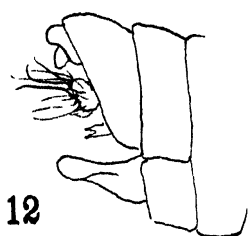
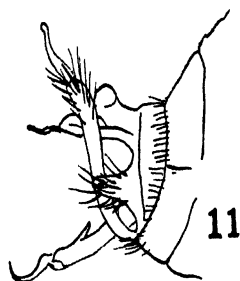
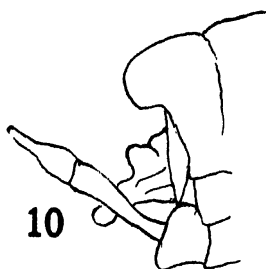
- Fig. 1—*Goerinella grandis*, fore-wing.  
 " 2—*Macronema splendens*, fore-wing.  
 " 3—*Goerinella grandis*, head.  
 " 4— " " hind-wing.  
 " 5—*Allosetodes plutonis*, hind-wing.  
 " 6—*Neopanorpa flavicauda*, genitalia, above.  
 " 7—*Allosetodes plutonis*, front wing.  
 " 8—*Neopanorpa flavicauda*, genitalia, side.  
 " 9—*Goerinella grandis*, genitalia, side.  
 " 10—*Sciops elongata*, genitalia, side.  
 " 11—*Hydropsyche isolata*, genitalia, side.  
 " 12—*Polyplectropus unicolor*, genitalia, side.  
 " 13—*Sciops pallidus*, genitalia, side.  
 " 14—*Allosetodes plutonis*, genitalia, side.  
 " 15—*Micrasema borneensis*, genitalia, above.  
 " 16—*Polyplectropus irrorata*, genitalia, side.  
 " 17—*Sciops oculata*, genitalia, above.  
 " 18—*Protohermes bellulus*, genitalia, below.  
 " 19— " *uniformis*, genitalia, side.  
 " 20— " " " below.







1930.]





## XX.—ON THE CARABIDÆ OF MOUNT KINABALU.

By H. E. ANDREWES.

(With 31 text figures).

In the autumn of 1929 I received from the F.M.S. Museums, Kuala Lumpur, a considerable collection of *Carabidæ* captured by Mr. H. M. Pendlebury during the previous spring on Mount Kinabalu in British North Borneo. Very few collectors appear to have explored this mountain, the only one of whom I have found any record being J. Whitehead, who, though chiefly interested in the ornithology of the district, also formed a collection of insects. Some of the *Coleoptera* which he took were submitted to H. W. Bates, who in 1889 described a new genus and four new species of *Carabidæ*. The only other collector seems to have been a local resident, Mr. J. Waterstradt, who has visited the mountain and sent a good many specimens of insects to Europe, but, judging by the indications given on the labels, he confined himself chiefly to the lower levels.

Mr. Pendlebury's collection was formed at various places and elevations, but, though he reached the top of the mountain, which is some 13,455 feet in height, no *Carabidæ* were taken much above 10,800 feet. It will save a good deal of subsequent repetition if I give here his account of the localities and elevations. The dates when the material was collected are shewn in brackets:

"A collecting visit was undertaken by the Raffles Museum, Singapore, and the Federated Malay States Museums, Kuala Lumpur, between the beginning of March and the end of May 1929, to Mt. Kinabalu (13,455 feet), British North Borneo.

Collecting was carried out chiefly at the higher altitudes, but nothing was found on the bare granite slopes between the tree limit and the summit of the mountain. Camps were made in the following localities:

**Pakka** 10,200 ft. The insect fauna at this altitude is limited to a few species only. The vegetation consists of about 200 feet of constantly damp forest and above this one reaches the stunted vegetation area which continues to the tree-limit which is, roughly speaking from 11,000—11,500 feet, though there are stretches of low-growing vegetation in some of the sheltered gullies to within a few hundred feet of the top crest. The temperature at Pakka is always low, and the ground is always in a saturated condition. About three species of *Carabidæ* were found, mostly under stones, under moss or amongst rotting vegetation. (March 23rd. to 25th).

**Kamborangah** 7,200 feet. This camp was situated on a narrow, rather exposed ridge with steep sides. The vegetation was typically montane and the trees considerably higher than those at Pakka. This is in the middle of the "mossy forest" area.

I noted that several specimens of a small Carabid beetle (*Bembidion*) were found roaming about at night below our camp in a small water hole that had dried off. (March 23rd. and April 6th).

**Lumu Lumu** 5,500 feet. In the middle of the mossy forest area—the trees were festooned with moss which was kept continually damp with mists and rain. The insect fauna here was more considerable than in the two higher camps. (April 6th. and 17th).

**Tenompok Pass** 4,700 feet. A part of a day was spent here on the outward journey. The bridle path from Kotabelud—Kabayau—Dallas reaches its highest point here and then descends to Bundu Tuhan and the interior of British North Borneo. (March 18th and April 19th).

**Kiau** 3,000 feet, is a village occupied by Dusun natives on the south western spur of the mountain. The forest has at one time or another been cleared all round the village and up to nearly 4,000 feet. Some patches of secondary growth have sprung up. (April 7th. to 9th).

**Kenokok** (or **Penokok**) about 3,300 feet, a good area of jungle at the head of the Kenokok valley which is the next valley north of Kiau. Most of the jungle below 3,000 feet has been cleared here; and much of the land is under cultivation by the Dusuns. (April 22nd—26th).

**Marei Parei**. A spur below the western peaks of Mt. Kinabalu at about 5,000 feet. Vegetation on the spur itself is scanty and the ground which consists of only a shallow layer of soil over rock is sodden. (April 27th and May 2nd).

**Kabayau** 600 feet. A rest house about eighteen miles from Kotabelud, on the bridle path to Mt. Kinabalu. Much of the original jungle has been cleared in this area, and the fauna consists of lowland species. A few days were spent here on the return journey. (May 12th). H.M.P."

The number of species in Mr. Pendlebury's collection is 45, of which 27 are new and are here described, but, in order to make my account of the *Carabidæ* found on the mountain as complete as possible, I have added the names of a further 26 species, including 5 new ones, represented either in my own collection or in other collections which have passed through my hands, so that the total is 71 species. By far the largest number of novelties, including 3 new genera, and 14 new species of the genus *Colpodes*, was found by Mr. Pendlebury. Of the 5 additional species described, all I think due to Mr. Waterstradt, the type

specimens are in my collection, but all the other types have been presented by the F.M.S. Museums to the British Museum.

The fauna on the whole is a remarkable one, and in particular the specimens of the three new genera all present an unusual appearance and characters; a little more than half the species, chiefly those taken at the lower levels, are either widely distributed or at least represented in the adjacent islands, but no less than 33, nearly all found by Mr. Pendlebury at from 3,000 to 10,000 feet, are peculiar to the mountain.

In the enumeration of the species I have, for greater clearness, enclosed in brackets the names of those not met with by Mr. Pendlebury, and, as full references to and the synonymy of the species already known are given in my *Catalogue of Indian Carabidæ*, now in course of publication, I have not thought it necessary to do more here than insert the original references. The only additions to the descriptions of the new species, which follow the enumeration are (i) a key to the numerous species of *Colpodes*, (ii) some observations on Bates' genus and species *Arhytinus bembidioides*. I may add that I have seen in the collection of the Brussels Museum single specimens of a new species of *Holcoderus* and of a new genus and species, both in a poor state of preservation.

Very nearly all the new species have been figured; of the figures, Nos. 1 and 3 were drawn by Miss O. F. Tassart and the remainder by Miss B. Hopkins; I have to thank both artists for the care and accuracy with which they carried out the work.

#### Enumeration of the species.

- [ 1. *Scarites dicælus* Chaud., Mon. des Scaritides (ii).  
Ann. Soc. Ent. Belg. 1880, p. 52; Andr. Stett. Ent.  
Zeit. 1930, p. 132.  
Also known from Singapore and Sumatra. Both  
this and the next species belong to the subgenus  
*Dicælus*.]
- [ 2. *Scarites borneensis* Bänn., Ent. Blätt. 1928, p. 65.  
Confined so far as I am aware to Mt. Kinabalu.]  
**Orictites** gen. n. (see p. 438).
- 3. *Orictites minotaur* sp. n. (see p. 440).
- [ 4. *Clivina memnonia* Dej., Spec. Gen. v, 1831, p. 503;  
Andr., Faun. Brit. Ind. Carab. i, 1929, pp. 354 and  
362, fig. 53.  
A common species throughout South-East Asia.]
- [ 5. *Clivina javanica* Putz., Mon. des Clivinas et genres  
voisins, Mém. Liège ii, 1846, p. 592.  
Common, but confined to the Malay region.]

- [ 6. *Clivina castanea* Westw., Proc. Zool. Soc. 1837, p. 128; Andr., Faun. Brit. Ind. Carab. i, 1929, pp. 355 and 374, fig. 54.  
A very widely spread species in South-East Asia, extending to Japan in the North and New Guinea in the South.]
- [ 7. *Clivina monticola* sp. n. (see p. 441).]
- 8. *Bembidion pendleburyi* sp. n. (see p. 442).
- [ 9. *Craspedophorus sundaicus* Oberth., Notes Leyd. Mus. v, 1883, p. 221.  
Known to me only from Sumatra and Borneo.]
- 10. *Chlænienus bimaculatus* Dej., Spec. Gen. ii, 1826, p. 301.  
Kiau, 1 ex. One of the commonest species in South-East Asia.
- 11. *Chlænienus hamatus* Dej., Spec. Gen. v, 1831, p. 633.  
Kiau, 1 ex. Originally described from the Philippine Is., and known through the northern part at least of the Malay region.
- [12. *Chlænienus acroanthus* Chaud., Mon. des Chleniens, Ann. Mus. Civ. Gen. viii, 1876, p. 112.  
Fairly common throughout the Malay region.]
- [13. *Chlænienus circumdatus* Brulle, Silb. Rev. Ent. iii, 1835, p. 283.  
Very common in South-East Asia.]
- [14. *Oodes issus* sp. n. (see p. 444).]
- 15. *Simous borneensis* Bates, Proc. Zool. Soc. 1889, p. 384.  
Kiau, 1 ex. Kabayau, 1 ex. Confined, so far as I know, to Borneo and Sumatra. The type specimen, which came from Mt. Kinabalu, is now in the British Museum.
- 16. *Trichotichnus sumatrensis* Andr., Ann. Mag. Nat. Hist. (9). xviii, 1926, p. 279.  
Kiau, 1 ex. The species was described from Sumatra, but, in addition to Sumatran specimens, I have in my collection an example labelled "Taroena, Great Sangir."
- [17. *Trichotichnus orinus* sp. n. (see p. 445).]
- 18. *Cælostomus picipes* MacL., Ann. Jav. 1825, p. 24.  
Kenokok, 1 ex. Found throughout South-East Asia, but replaced by another species in Japan. According to Chaudoir it has also been met with in Queensland.
- [19. *Cælostomus montanus* sp. n. (see p. 446).]
- [20. *Morion orientale* Dej., Spec. Gen. i, 1825, p. 432.  
Common throughout South-East Asia.]
- [21. *Morion doriæ* Putz., Ann. Mus. Civ. Gen. iv, 1873, p. 217.  
Known to me only from Borneo and Sumatra.]

22. *Trigonotoma psyche* Tchitch., Hor. Soc. Ent. Ross. xxx. 1897, p. 262.  
Kiau, 1 ex. Apparently confined to northern Borneo. I have in my collection other specimens from Mt. Kinabalu, taken by J. Waterstradt.
- [23. *Trigonotoma kuntzeni* Hubenth., Deutsch. Ent. Zeitschr. 1914, p. 437.  
The type is the only known specimen.]
- [24. *Trigonotoma venus* Tchitch., Hor. Soc. Ent. Ross. xxx, 1897, p. 260.  
I have seen only one specimen taken at about 3,000 feet. At present known only from Borneo.]
25. *Lesticus suavis* Tchitch., Hor. Soc. Ent. Ross. xxx. 1897, p. 268.
- [26. *Abacetus ceylanicus* Nietn., Ann. Mag. Nat. Hist. (3), ii, 1858, p. 178.  
I have 3 ex. in my collection, which I have not been able to distinguish from Nietner's species, known hitherto only from Ceylon.]
- [27. *Dioælidus collinus* sp. n. (see p. 447).]  
*Aloma* gen. n. (see p. 448).
28. *Aloma mirum* sp. n. (see p. 449).  
*Idiastes* gen. n. (see p. 450).
29. *Idiastes alaticollis* sp. n. (see p. 451).
30. *Idiastes costatus* sp. n. (see p. 453).  
Key to the species of the genus *Colpodes* (see p. 453).
31. *Colpodes fryi* Bates, Proc. Zool. Soc. Lond. 1889, p. 384.

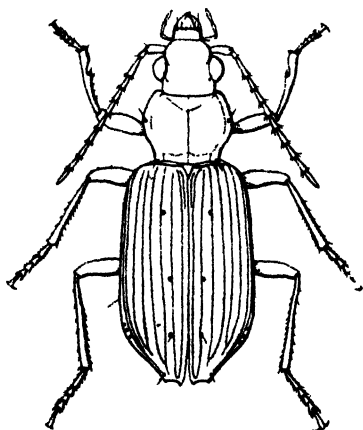


Fig. 10. *Colpodes fryi* Bates.

Lumu Lumu, 2 ex. Marei Parei, 6 ex. The only other known example is the type specimen, now in the British Museum.



32. *Colpodes bilineatus* sp. n. (see p. 455).
33. *Colpodes lautulus* sp. n. (see p. 457).
34. *Colpodes fuscus* sp. n. (see p. 458).
35. *Colpodes klossi* sp. n. (see p. 459).
36. *Colpodes porphyrodes* sp. n. (see p. 461).
37. *Colpodes humilis* sp. n. (see p. 463).
38. *Colpodes xneolus* sp. n. (see p. 464).
39. *Colpodes rubescens* sp. n. (see p. 466).
40. *Colpodes microps* sp. n. (see p. 467).
41. *Colpodes asthenes* sp. n. (see p. 468).
42. *Colpodes abruptus* sp. n. (see p. 469).
43. *Colpodes apotomus* sp. n. (see p. 470).
44. *Colpodes olearis* sp. n. (see p. 471).
45. *Colpodes sandalodes* sp. n. (see p. 472).
46. *Anchomenus ceylonicus* Motch., Etudes Ent. viii, 1859, p. 36.

Kamborangah, 1 ex. Hitherto known only from Ceylon. Mr. Pendlebury's specimen, though rather small, does not differ otherwise from the typical form, of which I have also quite recently seen examples from Sumatra.

47. *Dicranoncus quadridens* Motch., Etudes Ent. viii, 1859, p. 32.

Kiau, 1 ex. Kenokok, 1 ex. Found commonly throughout South-East Asia, but not known from Japan or New Guinea. In Indian examples, as a rule, the legs, except the knees, are pale, but in these, as in Malay specimens generally, the legs are mostly black.

48. *Euphlynes aurocinctus* Bates, Proc. Zool. Soc. Lond. 1889, p. 384.

Kenokok, 4 ex. Confined, so far as I am aware, to Borneo and Sumatra. The type specimen, which came from Mt. Kinabalu, is in the British Museum.

*Arhytinus* Bates (see p. 473).

For reasons given later on I have thought it desirable to add such further particulars as appear necessary to the descriptions of both genus and species.

49. *Arhytinus bembidioides* Bates (see p. 474).

Tenompok Pass 1 ex. Originally described from Annam, this species has since been met with in the Karen Hills, Sikkim, Perak, and Sumatra.

- [50. *Dinopelma plantigradum* Bates, Proc. Zool. Soc. Lond. 1889, p. 385.

So far as at present known confined to Mount Kinabalu. The type specimen is in the British Museum.

Bates' account of this genus is very unsatisfactory. He places it among the *Ctenodactylini*, whereas the jointed inner lobe of the maxillæ places it in close proximity to *Heragonia*. Further, he states that the fourth tarsal joint is entire, whereas in fact it is very deeply bilobed. One of the chief characters distinguishing the genus from *Heragonia* is the ligula, of which the front margin is truncate instead of being deeply cleft, but a more obvious character is the form of the prothorax, which in all the species known to me (including some undescribed ones) is subquadrate, instead of cordate.]

51. *Dinopelma quadratum* sp. n. (see p. 475).

52. *Dinopelma angustum* sp. n. (see p. 476).

53. *Ophionea nigrofasciata* Schm. Goeb., Faun. Col. Birm. 1846, p. 21.

Kiau, 2 ex. Common throughout South-East Asia, but in India confined apparently to the north-east corner.

- [54. *Odacantha tenuis* Andr., Ann. Mag. Nat. Hist. (9). xviii, 1926, p. 280.

The type, which is in my collection, came from Brunei, but there are examples from Mt. Kinabalu in the collections both of the Brussels Museum and of Mr. M. Liebke. I have also seen specimens from Sumatra.]

- [55. *Drypta lineola* Macl., Ann. Jav. 1825, p. 27.

A very common and widely spread eastern species, which shows great variability; no doubt, when more closely studied, it will be found to form numerous local races or varieties, indeed two have already been described by Chaudoir.]

- [56. *Desera geniculata* Klug, Jahrb. Ins. 1834, p. 52.

As widely spread as the foregoing and extending its range to Japan.]

57. *Desera crassa* sp. n. (see p. 477).

- [58. *Pheropsophus occipitalis* Macl., Ann. Jav. 1825, p. 28.

The area of distribution is a fairly wide one in South-East Asia, and the species is particularly common in the Malay islands, I have seen no example from north-west India or from Indo-China.]

- [59. *Pheropsophus javanus* Dej., Spec. Gen. i, 1825, p. 305.  
var. *agnatus* Chaud., Ann. Soc. Ent. Belg. 1876,  
p. 43. Both type-form and variety are as com-  
mon as in the case of the previous species and  
the distribution is similar, except that in this  
case examples have been found as far north as Japan  
and eastern China, and as far south as New  
Guinea. The genus needs revision very badly.]
60. *Orthogonius monolophus* sp. n. (see p. 479).
61. *Catascopus presidens* Thoms., Arch. Ent. i, 1857,  
p. 281.  
Kabayau, 1 ex. Malay Peninsula, Sumatra,  
Borneo, Celebes.
- [62. *Catascopus facialis* Wied., Zool. Mag. i, 3, 1819, p. 165.  
var. *angulatus* Chaud., Berl. Ent. Zeitschr. 1861,  
p. 117. This form is found chiefly in the Malay  
Peninsula and Archipelago.]
63. *Pericalus cordicollis* sp. n. (see p. 480).
64. *Pericalus quadrimaculatus* MacL., Ann. Jav. 1825,  
p. 15. Kabayau, 7 ex. Common throughout the  
Malay region.
65. *Pericalus longicollis* Chaud., Ann. Soc. Ent. Belg. xii.  
1869, p. 159.  
Kabayau, 2 ex. Kenokok, 1 ex. Fairly common  
in the Malay Peninsula; I have seen examples  
from Sumatra and Borneo only among the Malay  
islands.
66. *Mochtherus tetraspilotus* MacL., Ann. Jav. 1825, p. 25.  
Kenokok, 2 ex. A very common species with a  
very wide range, extending to as distant a spot  
as Samoa; I have seen specimens from Formosa,  
but not from Japan or Australia.
67. *Dolichoctis constricticollis* sp. n. (see p. 482).
68. *Dolichoctis bifasciatus* sp. n. (see p. 483).
69. *Parena pendleburyi* sp. n. (see p. 484).
- [70. *Physodera eschscholtzi* Parry, Trans. Ent. Soc. Lond.  
1849, p. 179, t. 18, f. 2.  
Ceylon, North East India, Burma, Indo-China.  
Southern China, the whole Malay region, and the  
Philippine Islands.]
71. *Risophilus hamatus* Schm. Goeb., Faun. Col. Birm.  
1846, p. 35.  
Marei Parei, 1 ex. Known hitherto only from  
the Nilgiri Hills and Tenasserim.

Genus *Orietites* gen. n.

Form elongate, body winged. Head wide, clypeus  
bisetose, fused with the wings, with an emargination bet-

ween them and the frontal plates, trisulcate on each side behind; eyes rather small, enclosed by the genæ behind, a sulcus on each side (receiving the first joint of the antennæ) between them and buccal fissure, two supraorbital setæ; labrum sex-setose, slightly emarginate at middle, ciliate at sides; mandibles considerably shorter than head, curved and sharp, the upper margin of the scrobe in the form of a raised carina, right mandible with a short tooth a little in front of middle, upper surface smooth; ligula fairly wide, with rounded sides, emarginate at apex, presumably bisetose (though only a single seta is visible), paraglossæ free, very narrow and slender, originating far back and hardly extending forward beyond middle of ligula; mentum subrectangular, lobes truncate at apex, with wide triangular epilobes along inner margin, a pair of rounded bosses at base, with a deep longitudinal sulcus between them, a wide, moderately sharp tooth in the emargination, its median area raised, though with a depression at middle; maxillæ slender, hooked at apex, densely ciliate within up to apex, outer lobe jointed; palpi glabrous, slender, somewhat pointed at apex, the apical joint in the maxillaries half as long again as the penultimate, the last two joints about equal in the labials, the apical one constricted close to apex, the penultimate bisetose; antennæ short, not quite reaching hind angles of prothorax, joints 1 and 2 quite glabrous, the rest pubescent, moniliform, about as long as wide, 11 a little longer, 1 subcarinate at sides, a little longer than 2, 2 about a half longer than the rest. *Prothorax* subquadrate, the sides of base oblique; median line and front transverse impression strongly marked, surface very uneven. *Elytra* subcylindrical, with the base truncate; 8-striate, the striæ very deep, a scutellary stria present. All the sterna longitudinally sulcate, the prosternal process very oblique, a fovea between the coxæ, and behind it, separated by a transverse ridge, a larger, shallow, rectangular, excavated area. Venter with the segments bisetose, last segment with two marginal setæ on each side, last three segments transversely sulcate and finely crenulate along front margin. Legs adapted for digging: profemora dilated behind, the trochanters produced into a tooth in front; protibiæ with a long curved apical digitation and two well developed teeth along outer margin, mesotibiæ with spur close to apex; protarsi with joint 1 as long as the next three taken together, but barely as long in the two hind pairs of legs.

Genotype: *Oricites minotaur* Andr.

The genus clearly belongs to the *Scaritini*, and the presence of two supraorbital setæ, two setæ on the penultimate joint of the labial palpi, together with antennæ pubescent from and including joint 3, place it among the smaller members of the group. The mandibles are not

extremely long and slender, nor are the genæ unusually developed, so that it will not fit into the *Oxytomides* and, at least provisionally, I place it among the *Clivinides*, though it differs widely in appearance from the genera at present included in that subgroup. The very rough surface of the head, the unusual form of the median line of the prothorax, which recalls that often seen in the genera *Holcoderus* and *Mastax*, and the filamentous paraglossæ are all unusual features. An even more unusual circumstance is the fact that the paraglossæ are not actually attached to the ligula, but spring from the sides of the supporting piece behind it.

*Orietites minotaur* sp. n. [Fig. 1].

Length 10 mm.

Black, shiny: antennæ and tibiæ piceous, palpi and tarsi dark ferruginous.

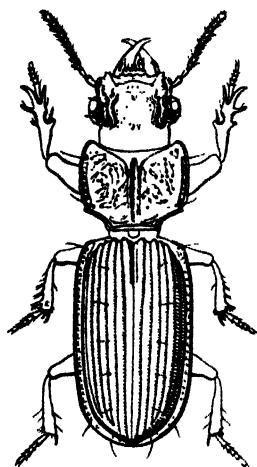


Fig. 1. *Orietites minotaur* gen. et sp. n.

*Head* wide, its upper surface very uneven, clypeus impunctate, a slight knob in the middle behind, the front margin of the median part quadridentate, wings fused with the median part, but projecting forwards on each side as a fairly sharp tooth, frontal plates separated from wings by a slight notch, concave on each side in front and raised into a boss behind, clypeal suture visible only at sides; eyes moderately prominent, three ridges and three sulci on each side between them, the two supraorbital pores lying on the intermediate ridge; neck smooth behind, constricted in front slightly in the middle, more deeply at sides; front, vertex, and neck constriction bearing numerous punctures of varying sizes, the two former also with some vague longitudinal striation. *Prothorax* moderately convex, a little

wider than the head and about a fourth wider than long, base bordered, oblique at sides, the median part produced, apex rather faintly trisinate, the front angles projecting moderately forwards, sides parallel, with a fine, slightly crenulate border, a wide smooth costa running between the angles and parallel with the sides, the lateral channel between this and the border wide, deep, and somewhat uneven, owing to the presence of slight transverse ridges, two lateral setæ, just behind the front angle and in front of the hind one, the latter projecting as a small sharp tooth; median line very wide, with a border on each side, not reaching front margin, front transverse impression rather deep, distant at middle from margin, the area between the two raised and smooth, hind transverse impression not strongly marked, basal foveæ small, adjoining the angles; surface generally covered with large, irregular, and sometimes confluent punctures, a few transverse rugæ across base. *Elytra* convex, slightly wider than prothorax, two thirds longer than wide, faintly dilated behind, the sides being nearly parallel, bordered, with some crenulation behind the very square shoulders, basal border more evidently crenulate, a little raised and thickened over the shoulders; striæ deep, finely and vaguely crenulate, scutellary stria also fairly long and deep, 1 joining 2 at base, 3 free, 4 joining 5; intervals convex, especially at sides, 1, 3, and 4 each bearing a tubercle at its point of origin, 8 forming a narrow carina both in front and behind, 3 with five pores, from which spring long erect setæ, all adjoining stria 3, marginal channel with a closely placed row of small setiferous tubercles, surface impunctate.

The species is quite unlike any other known to me.

Lumu Lumu. 2 ex.

***Clivina monticola* sp. n.** [Fig. 2].

Length: 6.5-7 mm.

Piceous: palpi, joints 1 and 2 of antennæ, and legs more or less ferruginous.

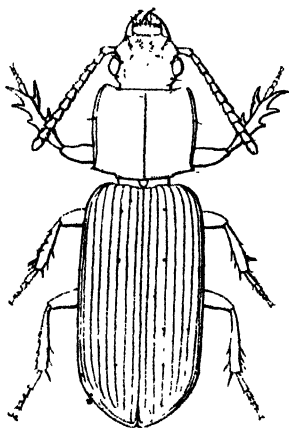


Fig. 2. *Clivina monticola* sp. n.

*Head* with fairly prominent eyes, median part of clypeus truncate, bordered, slightly dentate at sides, the wings only slightly behind it but separated from it by a distinct notch, frontal plates separated from clypeus by a similar notch, convex in front, their outer margin almost angulate; surface of clypeus a little depressed behind the front margin, and behind this there are usually some irregular transverse rugæ or striæ, but the clypeal suture is obsolete; frontal impressions deep and irregular, facial carinæ short and thick, neck constriction fairly deep, punctate, vertex with a fovea of variable form and sometimes a few slight rugæ; labrum truncate, 7-setose, mandibles short and stout, mentum wide, the tooth as long as lobes, obtusely pointed, and a little concave beneath, antennæ moniliform, joint 2 not much longer than 3. *Prothorax* convex, quadrate, nearly as long as wide, sides faintly curved, front angles hardly projecting, hind angles strongly toothed, sides of base straight; median line and front transverse sulcus fairly deep, latter reaching margin at extremities, surface slightly wrinkled, with an ill defined Y-shaped figure on each side, the stalk not quite reaching base and the arms formed by minute punctures. *Elytra* moderately convex, twice as long as wide, sides nearly parallel, shoulders well marked; striæ fairly deep, almost imperceptibly crenulate, 1 to 4 free at base (but sometimes 1 joins 2), 5 to 7 meeting behind shoulder, striae vestigial; intervals moderately convex, 3 with four elongate pores adjoining stria 3, 8 carinate behind. Prosternal ridge sulcate and not very narrow, venter finely punctate at sides, apical segment with the two pores distant from each other. Profemora dilated but not dentate beneath; protibiæ sulcate on upper surface, with three digitations and small upper tooth; mesotibiæ with a stout spur not far from apex.

In my table of the Indian species of *Clinina* (Fauna of British India, *Carabidæ*, Vol. i, 1929, p. 353) the species would come alongside *C. helferi* Putz., to which it bears little resemblance. It is about the same size as *C. javanica* Putz., but piceous: the head more rugosely sculptured and without clypeal suture, the prothorax with a much more marked tooth at hind angles, the elytra wider and less deeply striate.

Kinabalu: without indication of more precise provenance, 6 ex. The type is in my collection.

***Bembidion pendleburyi* sp. n. [Fig. 3].**

Length 5 mm.

Upper surface black, with a suggestion of æneous reflections, underside piceous: palpi, joints 1 and 2 of antennæ

(rest fuscous), legs, and apex of elytra dark ferruginous, femora and trochanters rather paler than tibiæ and tarsi.

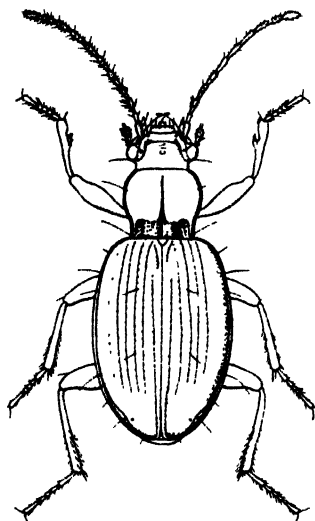


Fig. 3. *Bembidion pendleburyi* sp. n.

*Head* with deep, parallel, somewhat uneven furrows, extending on to clypeus, eyes prominent, antennæ nearly reaching middle of elytra, surface impunctate, some vague transverse striation across middle of front and vertex. *Prothorax* convex, cordate, only a little wider than head or than long, sides rounded in front, sinuate at a fourth from base, the hind angles right, sharp, not projecting laterally, with a long carina; median line clearly marked, wider and deeper behind, transverse impressions slight, basal foveæ deep, adjoining the carinæ, disk smooth and polished, the basal area considerably depressed and coarsely punctate. *Elytra* convex, ovate, rather pointed at extremity, four-fifths wider than prothorax, two-fifths longer than wide, shoulders present but much rounded, sides strongly rounded, the widest part a little behind middle, the border rounding the shoulder and reaching the base of stria 5; rather finely and lightly punctate-striate, the striæ moderately impressed on disk only, 8 deep behind, joining marginal channel behind shoulder, scutellary striole short, joining stria 1 at base, both moderately deep at that point, apical stria obsolete, so that the large pre-apical pore is isolated; intervals flat, 3 with two pores on the interval, though only slightly removed from stria 3. No microsculpture on elytra or prothorax, but a reticulation of isodiametric meshes is visible on the head, especially on the neck. Venter glabrous, pro- and mesepisterna coarsely punctate. metasternal process unbordered.

Kamborangah 5 ex.



This appears to be the first *Bembidion* not merely described, but even recorded from Borneo. This species, like so many of those found in the Himalayas, does not show any close agreement with those of the palæarctic regions. It is, however, clearly allied to those included in *Synechostiotus* and *Pseudolimnæum*, though the form of stria 8 is different. This is deep, behind, but is impressed throughout, and joins the marginal channel at about a fourth from base. The eyes are large and prominent, the basal part of the median line of the prothorax is deep and wide, but not bordered, and both striae and punctures on the elytra are less impressed than in most of the species of these subgenera.

*Oodes issus* sp. n. [Fig. 4].

Length: 7.5—8 mm. Width: 3.1—3.4 mm.

Black, rather dull, shiny and a little iridescent beneath; tarsi and sometimes apical margin of venter ferruginous.

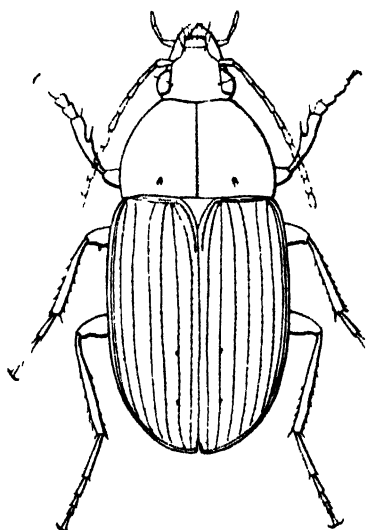


Fig. 4. *Oodes issus* sp. n.

*Head* rather flat, eyes moderately prominent, clypeus truncate, frontal foveæ minute, punctiform. *Prothorax* rather flat, not quite twice as wide as head, and not quite a half wider than long, base trisinate, apex emarginate, strongly contracted in front, sides evenly rounded, widest just in front of base, hind angles right but a little rounded; median line very faint, basal foveæ short but distinct, converging inwards and ending in a puncture. *Elytra* moderately convex, ovate, but with square shoulders, about a fifth wider than prothorax and fully a half longer than

wide, border very faintly sinuate near apex; striæ moderately deep and rather finely crenulate, becoming gradually deeper from within outwards, 1 and 2 arising from a common umbilicate pore, striae fairly long, formed by minute punctures, intervals nearly flat on disk, but very convex at sides, 8 narrow and subcostate, 3 with a pore behind middle and another towards apex. Microsculpture isodiametric, the meshes on head and prothorax much smaller than those on the elytra; the whole of the upper surface is also minutely punctate. Prosternal process unbordered, metasternal process bordered; proepisterna and sides of venter finely punctate, metasternum and metepisterna coarsely punctate, latter not much longer than wide; apical ventral segment rugose-punctate and emarginate on each side in both sexes. Protarsi ♂ with joint 1 subquadrate, but contracted at base, joint 2 nearly square, joint 3 narrower and a half longer than wide.

Very near *O. siamensis* Chaud., but a little shorter and proportionately a little wider. The sides of the prothorax are more evenly curved, the elytral striæ evidently deeper, especially near base, the outer intervals much more convex; the microsculpture and the ♂ protarsal characters are exactly similar.

Mt. Kinabalu 1 ex. ♀; Brunei, 2 ex. ♂ ♀, received some years ago from Mr. T. G. Sloane. The type is in my collection.

*Trichotichnus orinus* sp. n. [Fig. 5].

Length: 8 mm. Width: 3.3 mm.

Black, elytra somewhat iridescent: palpi ferruginous, antennæ and legs piceous.

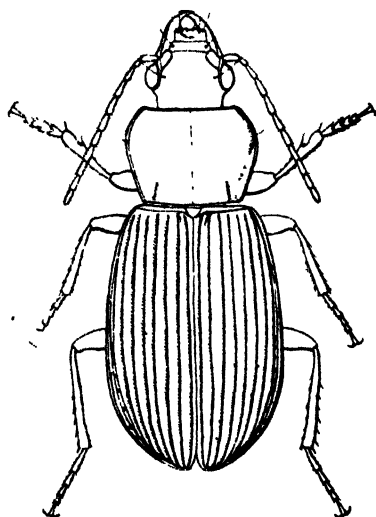


Fig. 5. *Trichotichnus orinus* sp. n.

*Head* convex, smooth, clypeal suture very fine, the oblique lines joining its ends on each side with the eye-sockets moderately deep, labrum with a semicircular depression, eyes prominent, antennæ extending a little beyond base of prothorax. *Prothorax* convex, subquadrate, base a little wider than apex, widest just before middle, a half wider than head and fully a third wider than long, sides finely bordered, rounded in front, straight behind, the lateral seta at a third from apex, hind angles obtuse and slightly rounded, but not reflexed; median line and front transverse impression rather slight, hind transverse impression obsolete, sides of base faintly depressed, with a short faint linear impression on each side, not far from the angles, surface smooth, sides of base and lateral channels finely and sparsely punctate. *Elytra* convex, about a third wider than prothorax, not quite a half longer than wide, rather strongly dilated behind, barely sinuate before apex; striæ deep and impunctate, striae very short, arising with 2 in a minute umbilicate pore, intervals convex, 3 with a minute pore at about a fifth from apex, marginal series widely interrupted, surface very smooth and shiny. No visible microsculpture on the elytra, but very faint transverse lines are visible on the prothorax, and isodiametric meshes are just perceptible on the head. Underside impunctate; prosternal process setulose; metepisterna half as long again as wide. I can only detect a single marginal seta on each side of the apical ventral segment.

My two specimens, both apparently ♀, are in poor condition, and I only describe the species to render my work as complete as possible. A little larger and darker than *T. congruus* Moraw., but with more prominent eyes, the hind angles of the prothorax a little rounded and the adjacent surface more finely punctate, the elytra slightly iridescent, with a rudimentary striae and a very minute puncture on interval 3.

Kinabalu, 2 ex. ♀ ♀. Type in my collection.

*Cælostomus montanus* sp. n.

Length: 5-6 mm.

Black, shiny, faintly iridescent; palpi ferruginous, antennæ and legs more or less piceous.

*Head* convex, smooth, glabrous, frontal foveæ deep, uneven, diverging behind, bounded outwardly by a ridge, between which and the margin there is on each side a fairly deep sulcus, a slight pore on vertex, eyes moderately prominent. *Prothorax* convex, subquadrate, fully a half wider than head, a third wider than long, base a little wider than apex, sides with a narrow reflexed border, gently rounded, but straight just before hind angles, which project laterally on each side as a minute tooth, bearing a seta, no seta

visible in front, though there are some minute pores in the lateral channels; median line moderately deep, basal foveæ very deep, converging a little in front and not quite reaching middle, surface smooth. *Elytra* convex, with square shoulders and nearly parallel sides, rather more than a third wider than prothorax and rather more than a fourth longer than wide; striæ deep, finely crenulate, intervals convex, rather more convex at sides, surface smooth. The microsculpture of the elytra and prothorax is formed by excessively fine, barely visible ( $\times 80$ ), transverse lines; on the head there are rather faint isodiametric meshes. Pro- and metasterna longitudinally sulcate, prosternum with a few punctures along the inner margin, metasternal process bordered, metepisterna much longer than wide and with a few large irregular punctures. Venter punctate at sides and a long front margins of the last 3 segments, where the surface is depressed but not sulcate; last segment  $\delta$  with a single marginal seta,  $\eta$  with two setæ on each side. Pro-tibiæ with only a couple of minute spines before apex; protarsal joints truncate at extremities.

The species belongs to the section *Drimostoma* and is nearly related to *C. rectangulus* Chaud. The eyes are more prominent, the front lateral seta of the prothorax, conspicuous in *rectangulus*, is here wanting; the elytra are wider, with much deeper and a little more coarsely crenulate striæ, the intervals much more convex.

Kinabalu, many ex. The type is in my collection; a cotype in the F.M. S. Museums. I also have in my collection two specimens from Pagat, Borneo (*Grabowsky*), received some years ago from Mr. T. G. Sloane.

*Dicælidus collinus* sp. n. [Fig. 6].

Length: 9 mm. Width: 3.5 mm.

Black, shiny, and more or less iridescent both above and beneath; palpi dark ferruginous, antennæ and tarsi piceous.

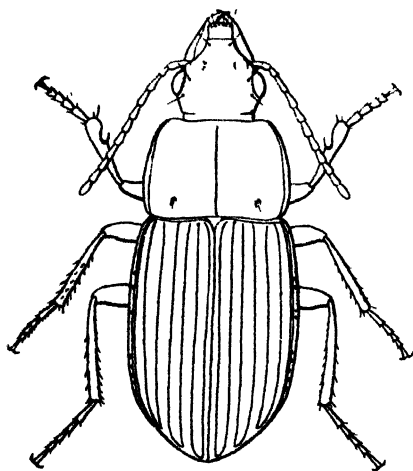


Fig. 6. *Dicælidus collinus* sp. n.

*Head* smooth, rather flat in front, with moderately impressed but rather short frontal foveæ, curving outwards to front margin of eye, eyes moderately convex, antennæ stout, extending a little beyond base of prothorax, mandible normal in both sexes. *Prothorax* moderately convex, subquadrate, nearly a half wider than head, a fourth wider than long, base a little wider than apex, sides bordered, the border narrow in front, much wider behind and reaching base, gently curved throughout, without lateral setæ, hind angles slightly obtuse and not very sharp; median line and front transverse impression both very faint, basal foveæ linear, deep in front and continued to base on each side by a shallow impression, surface impunctate. *Elytra* convex, ovate, a sixth wider than prothorax, a little more than a half longer than wide, shoulders square, apex with a very slight sinuation on each side; striæ deep, impunctate, 2 arising in a large umbilicate pore, intervals convex, without dorsal pores. Microsculpture throughout formed by excessively small meshes, averaging three times as wide as long on the elytra and twice as wide as long on the prothorax and occiput; on the front of the head the meshes are isodiametric; the whole surface is also microscopically punctate. The extremity of the prosternal process and the metasternal process are both bordered; the proepisterna, sides of metasternum, metepisterna, and sides of venter are all finely punctate; the apical ventral segment has one seta on each side in the ♂, 2 setæ in the ♀, all a little removed from margin; tarsal joint 5 glabrous beneath.

Smaller and narrower than *D. felspaticus* MacL., the palpi and antennæ darker, the elytra less iridescent. On the head the frontal foveæ are shallower and the upper margin of the right mandible ♂ is not dilated; the prothorax has the apex less emarginate, so that the front angles are quite inconspicuous, and the basal impressions are less deep; the elytra are narrower and a little more convex, but otherwise similar.

Kinabalu, 2 ex. ♂ ♀. The type is in my collection.

#### Genus *Aloma* gen. n.

Body apterous. *Head* glabrous, clypeus bisetose, eyes separated from buccal fissure by a concave area much wider than the first joint of the antennæ, two supraorbital setæ on each side, of which the hind one is somewhat removed from the eye, antennæ pubescent from and including joint 4, joint 1 scapiform and (as in *Trigonotoma*) about equal to the next three joints taken together, labrum fairly deeply emarginate, sexsetose, the two outer setæ distant from the four inner ones, mandibles long, hooked, very fine and sharp at apex, without seta in the scrobe, ligula fairly wide, apex somewhat dilated, bisetose, truncate, with the corners rounded, paraglossæ membranous, narrow, free, extending

very little beyond ligula, maxillæ very sharp, curved, inwardly fringed with bristles, outer lobe jointed, palpi very slender, glabrous, maxillaries with the last two joints equal, labials with the penultimate joint bisetose, a little shorter than apical joint, which is only slightly dilated in both sexes, mentum very short and wide, with a very short rounded tooth in the sinus. *Prothorax* subcordate, lateral borders bisetose and only moderately dilated. *Elytra* connate, without basal border or scutellary striae, 9-striate. Underside glabrous, prosternal process glabrous, deeply sulcate, not carinate behind, unbordered, ventral segments transversely sulcate, apical segment ( $\delta$   $\varphi$ ) with a single marginal seta on each side. Tarsi glabrous above, not sulcate, joint 1 of metatarsi nearly as long as  $2 + 3$ , 4 only slightly emarginate, 5 ciliate beneath, claws smooth; in the protarsi  $\delta$  joints 1 to 3 are moderately dilated and clothed beneath with whitish scales.

Genotype: *Aloma mirum* Andr.

The buccal organs are very similar to those of *Trigonotoma*, though even in the  $\delta$  the last joint of the labial palpi is not securiform; elsewhere there are wide discrepancies, especially in the general form of the upper surface, the slightly dilated lateral borders of the prothorax, and the absence both of basal border and scutellary striae in the elytra. The genus, however, should be placed in the same group of the *Pterostichini*.

*Aloma mirum* sp. n. [Fig. 7]. ,

Length: 12-13 mm. Width: 3.8-4 mm.

Black, shiny: joints 4 to 11 of antennæ and tips of palpi ferruginous.

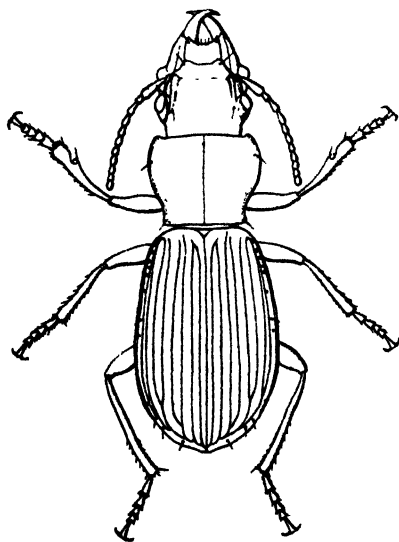


Fig. 7. *Aloma mirum* gen. et sp. n.

*Head* massive, hardly narrowed behind, neck somewhat inflated, genæ long but sloping very gently backwards, a hardly perceptible neck constriction, frontal foveæ deep and elongate, a rounded pore on each side within them, sides carinate in front, with three carinæ just within them, the middle one long and conspicuous, the outer one shorter, in front of eye, the inner one very short, level with eye, eyes rather small and flat, hardly projecting beyond genæ, antennæ with joints 2 to 11 submoniliform, reaching basal third of prothorax, surface impunctate. *Prothorax* convex, subcordate, very slightly wider than head and a fifth wider than long, widest not far from front angles, sides of base a little oblique, sides with a moderately thick border, a little thicker behind, very gently rounded in front, and slightly sinuate rather before the hind angles, front seta in the channel at a fourth from apex, hind one on the angle, hind angles strongly reflexed, somewhat obtuse, but very little rounded; median line fine, transverse impressions faint, basal foveæ merged in the lateral channels, which are narrow in front, but wider and deep behind, surface impunctate, lightly transversely striate. *Elytra* convex, ovate, a third wider than prothorax, not quite two thirds longer than wide, shoulders square apex somewhat pointed, with a faint emargination on each side; striæ fairly deep, deeper close to apex, impunctate, 1 to 3 and 6 bending outwards and 5 inwards close to base; intervals convex, 8 and 9 not reaching base, 1, 2, and 8 reaching apex, the pores of the marginal series on 9 few and large, the series interrupted at middle, no dorsal pores. The microsculpture is very faint, formed by isodiametric meshes (invisible on the prothorax), and the whole surface is also microscopically punctate. Pro- and metepisterna, and sides of metasternum and of basal segments of venter with very few but large punctures; metepisterna as wide as long.

The form is a little like that of a rather narrow *Molops*, but I can recall no similar species for the purpose of comparison.

Pakka, 3 ex. ♂ ♀.

#### Genus *Idiastes* gen. n.

Body apterous. *Head* glabrous, clypeus bisetose, eyes distant from buccal fissure, one supraorbital pore and seta on each side, a little behind the level of, and remote from eye, antennæ pubescent from and including joint 4, labrum transverse, sexsetose, mandibles rather short, sharp, hooked, without any seta in the scrobe, ligula fairly wide, apex bisetose, rounded at sides, slightly emarginate at middle, paraglossæ narrow, membranous, curving inwards and extending a little beyond ligula, their apical half free, maxillæ sharp and hooked at apex, inwardly fringed with bristles, outer lobe jointed, palpi glabrous, slightly

attenuated and subtruncate at apex, maxillaries with the last two joints equal, labials with the penultimate joint bisetose, slightly longer than apical joint, mentum with the lobes oblique at sides, rounded at apex, the emargination with a stout, rounded tooth, about half as long as lobes, epilobes outwardly carinate, the extremity projecting as a short tooth on each side at apex. *Prothorax* with widely explanate and reflexed lateral margins, furnished with a single pore and seta. *Elytra* connate, with a basal border, 9-striate, a scutellary striole between stria 1 and suture, a well developed inner plica present, not reaching margin. Underside glabrous, prosternal process glabrous, unbordered, nearly vertical behind, compressed but hardly keeled. Procoxal cavities with a single opening inwards, femora almost glabrous, tibiæ very lightly setulose; tarsal joints not sulcate, joint 1 of the metatarsi barely as long as 2 + 3, joint 4 deeply emarginate in the pro- and mesotarsi, slightly emarginate in the metatarsi, joint 5 glabrous beneath, claws smooth; protarsi ♂ with the first three joints moderately dilated and furnished beneath with two irregular rows of whitish scales.

Genotype: *Idiastes alaticollis* Andr.

Although these insects are quite unlike any other Carabid known to me, the only reason for excluding the genus from the *Pterostichini* is the absence of a second supraorbital pore and seta. Even here, however, there are exceptions, so for the present I treat it as a member of that group.

*Idiastes alaticollis* sp. n. [Fig. 8].

Length 14.5—16 mm. Width 5.3—5.6 mm.

Black and rather shiny: palpi dark ferruginous, tarsi piceous.

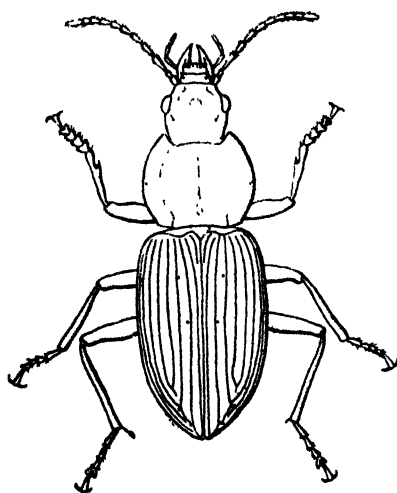


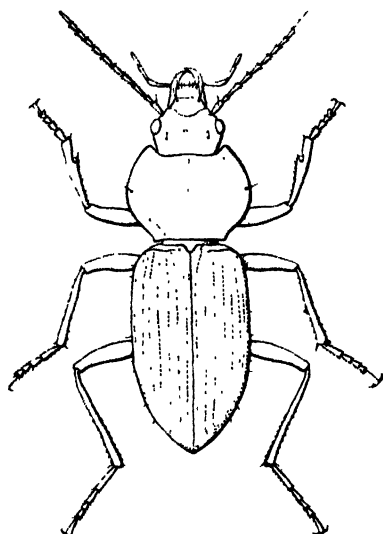
Fig. 8. *Idiastes alaticollis* gen. et sp. n.



*Head* rather flat, contracted gradually behind, only a suggestion of neck constriction, frontal foveæ short, wide, shallow, and uneven, a fairly large fovea, sometimes asymmetrical, on vertex, with a smaller one on each side, eyes small and moderately prominent, antennæ fairly stout, extending rather beyond base of prothorax, joints 1 and 3 equal, 4 to 11 a little shorter, 2 not much more than a half of 1, surface impunctate. *Prothorax* almost circular, the disk convex, nearly three fourths wider than head, about a fifth wider than long, base truncate, rather wider than apex, which is very finely bordered and deeply emarginate, though the median part, in contact with the neck, is truncate, the front angles projecting a long way forwards, slightly acute, but a little rounded, sides with a rather thick, unbordered margin, widely explanate and reflexed, evenly and rather strongly rounded, the pore and seta placed just behind middle at a little distance from margin, hind angles very obtuse, but only slightly rounded; median line fine, placed at the bottom of a longitudinal depression, which does not reach extremities, transverse impressions rather faint, basal foveæ deep and rounded, but continued forward as vague impressed lines, which first diverge and then converge, joining the ends of the front transverse impression, surface impunctate and a little uneven, some short transverse striæ adjoining the sides of the median line. *Elytra* convex, subovate, a sixth wider than prothorax two thirds longer than wide, basal border bisinuate, reaching scutellary striole, faintly dilated behind, the border hardly perceptibly sinuate before apex, the shoulders rather square; striæ rather fine, impunctate (though with very faint indications of puncturation on each side), 1 arising in an umbilicate pore, 8 deeper than the rest, scutellary striole short; intervals slightly convex, more convex at sides, 3 with two pores, front one at a fourth, hind one just behind middle, 7 with two pores close together at apex. Microsculpture of the elytra formed by meshes only a little wider than long; on the prothorax the meshes are much finer and wider; on the head the meshes are also fine and isodiametric. Underside impunctate; metepisterna hardly longer than wide; ventral segments bisetose, last segment ♂ with one marginal seta, ♀ with three or 4 on each side. The ædeagus in the ♂ is gently curved and gradually attenuated to a fine point.

***Idiastes costatus* sp. n. [Fig. 9].**

Length: 14–14.5 mm. Width: 4.75–5 mm.

Fig. 9. *Idiastes costatus* sp. n.

Similar to the preceding species, but differing in the following particulars. A little smaller and narrower, upper surface rather dull, the surface of the prothorax and of the even intervals of the elytra presenting a sericeous appearance, apical joints of antennæ brown. *Head* with the frontal foveæ deeper, a transverse ridge in front of the clypeal suture and a transverse impression in front of the fovea on vertex. *Prothorax* relatively wider, widest at a point distinctly behind middle, apex less deeply emarginate, the front angles less prominent and more rounded, sides rather more sharply rounded and slightly sinuate before the hind angles, which are sharp, though a little obtuse. *Elytra* narrower, practically as wide only as prothorax and twice as long as wide, sides a little less rounded, basal border only reaching the middle of interval 3, striae finely punctate, intervals costate, the odd ones (including 1) a little more raised and more shiny than the even ones, no dorsal pores on 3, but the two apical pores are present on 7. The microsculpture throughout is finer, the meshes even smaller, those on the elytra much wider than long.

Lumu Lumu, 3 ex. ♂♂.

**Key to the species of *Colpodes*.**

- 1 (6) Elytra mucronate at apex.
- 2 (5) Elytra with 4 spines or sharp teeth at apex.
- 3 (4) Elytra with inner tooth opposite interval 1, outer tooth near it, opposite stria 3, colour brassy, length 17 mm. . . *fryi* Bates (see p. 435).

- 4 (3) Elytra with a sharp spine at apex of interval 1 and a sharp tooth at outer angle of the truncature, colour bluish-purple, length 12.75 mm. . . *bilineatus* sp. n. (see p. 455).
- 5 (2) Elytra with a stout spine at apex of interval 1, outer angle of the truncature rounded, elytra bluish-green, head and prothorax ferruginous, length 8 mm. . . *lautulus* sp. n. (see p. 457).
- 6 (1) Elytra not mucronate at apex.
- 7 (22) Prothorax with two lateral pores on each side (the setæ often abraded), elytra with 3 dorsal pores.
- 8 (9) Elytra with the microsculpture formed by isodiametric meshes, a small obtuse tooth projecting slightly at apex of interval 1, colour piceous, length 12 mm. . . *fuscus* sp. n. (see p. 458).
- 9 (8) Elytra with the microsculpture formed by transverse lines or meshes, no projecting tooth at apex of interval 1.
- 10 (15) Joint 1 of metatarsi evidently bisulcate, length 8-10 mm.
- 11 (14) Hind supraorbital pore not in front of hind eye level, elytra two thirds longer than wide, black or dark purple, length 8.5-10 mm.
- 12 (13) Elytra black and iridescent, the striæ extremely fine and very faintly impressed, average length 9.5 mm. . . *klossi* sp. n. (see p. 459).
- 13 (12) Elytra dark purple, striæ moderately fine but distinctly impressed, average length 9 mm. . . *porphyrodes* sp. n. (see p. 461).
- 14 (11) Hind supraorbital pore placed in front of hind eye level, elytra four-fifths longer than wide, piceous, length 8 mm. . .  
.. .. *humilis* sp. n. (see p. 463).
- 15 (10) Joint 1 of metatarsi with at most a slight outer sulcus.
- 16 (17) Prosternal process pointed at extremity, the declivity carinate, elytra brassy purple, length 8.5 mm. . . *æneolus* sp. n. (see p. 464).
- 17 (16) Prosternal process not carinate, length 6-7 mm.
- 18 (19) Prothorax subquadrate, only slightly contracted behind, elytra a half longer than wide, brassy (reddish-purple at sides and apex)  
.. .. *rubescens* sp. n. (see p. 466).
- 19 (18) Prothorax cordate, considerably contracted behind, elytra less than a half longer than wide, black or piceous.
- 20 (21) Eyes standing out from the head (as in *C. æneipennis* Dej.), elytra very lightly striate .. *microps* sp. n. (see p. 467).

- 21 (20) Eyes not standing out from head, elytra with moderately deep striæ . . . .  
.. .. *asthenes* sp. n. (see p. 468).
- 22 (7) Prothorax with a single lateral pore.
- 23 (28) The lateral pore on prothorax placed just before middle.
- 24 (27) Elytra blue or violet with 3 dorsal pores, the apex abruptly declivous, length 12 mm.
- 25 (26) Elytra blue, apex of prothorax deeply emarginate, hind angles a little obtuse but evident . .  
.. .. *abruptus* sp. n. (see p. 469).
- 26 (25) Elytra violet, apex of prothorax slightly emarginate, hind angles rounded away  
.. .. *apotomus* sp. n. (see p. 470).
- 27 (24) Elytra black, highly polished and slightly iridescent, without dorsal pores, eyes small and prominent (nearly similar to those of *microps*), length about 7 mm. . . .  
.. .. *olearis* sp. n. (see p. 471).
- 28 (23) The lateral pore on prothorax placed on the hind angle, elytra ferruginous æneous, with a single dorsal pore placed at a third from apex, length 7.5 mm. *sandalodes* sp. n. (see p. 472).

***Colpodes bilineatus* sp. n. [Fig. 11].**

Length: 12.75 mm. Width: 4.7 mm.

Black, with some bluish reflections on the underside and femora; prothorax dark greenish-blue, elytra bluish-purple; apex of palpi and joints 4 to 11 of antennæ brown; tarsal joints clothed with golden hairs.

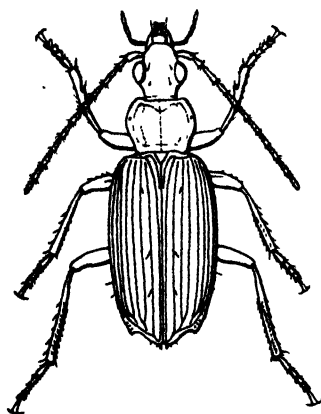


Fig. 11. *Colpodes bilineatus* sp. n.

*Head* moderately convex, neck lightly constricted, eyes prominent, hind supraorbital moderately distant from and level with hind margin of eye, frontal foveæ shallow, antennæ reaching basal third of elytra, surface a little uneven, impunctate, a slight depression on each side of vertex. *Prothorax* rather flat, about a third wider than head and a fourth wider than long, widest before middle, base truncate, apex emarginate, front angles moderately rounded, sides narrowly bordered in front only, widely explanate, rounded in front, moderately sinuate before base, two slight impressed lines on each side, parallel with margin, one along the inner edge of the explanate part, the other half way between it and margin, two lateral pores (no setæ visible), front one at the widest point, just within the margin, hind one on the margin, just in front of the angle, hind angles about right, reflexed, slightly rounded; median line very fine, transverse impressions and basal foveæ all moderately deep, surface a little uneven, some faint transverse striæ on disk, a few vague minute punctures along sides and in the foveæ. *Elytra* elongate-oval, moderately convex, not quite twice as wide as prothorax, two thirds longer than wide, shoulders rounded but evident, apex emarginate on each side, the emargination sinuate, outer angle forming a very sharp tooth, inner one shortly mucronate; striæ fairly deep, very finely and indistinctly punctate, 1 arising in an umbilicate pore, a scutellary striole present; intervals rather flat on disk, a little more convex near sides and apex, 7 narrow and convex near base and apex, 3 with three small pores, at a fifth, behind middle, and four fifths respectively, surface impunctate, without any special depressed areas. There is no microsculpture on the head or on the disk of the prothorax, but on the elytra there are transverse lines forming wide meshes. Underside impunctate, metepisterna nearly twice as long as wide; last ventral segment (♂) slightly emarginate and with a single seta on each side. Tarsal joint 5 glabrous beneath; meso- and metatarsal joints bisulcate and with the outer lobe of joint 4 evidently longer than the inner one.

About the same size as *C. saphyrinus* Chaud., but the elytra are bluish-purple rather than bluish-violet. In the prothorax the front angles are more rounded, the sides explanate, with two impressed lines on each side; in the elytra the striæ are less clearly punctate, interval 3 with more evident pores, interval 7 very narrow and almost costate towards apex, the outer angle of the apical truncature shorter.

Kenokok, 1 ex. ♂.

***Colpodes lautulus* sp. n. [Fig. 12].**

Length: 7.5–8.5 mm. Width: 2.9–3.3 mm.

Metasternum, venter, metafemora and tibiæ and all knees black; head and prothorax (above and beneath). mesosternum, joint 1 of antennæ, with base of next three joints (rest piceous), palpi (more or less), and apical two thirds of pro- and mesofemora ferruginous; pro- and mesotibiæ and all tarsi more or less piceous; elytra metallic green with occasional bluish reflections, cupreous on each side close to apex.

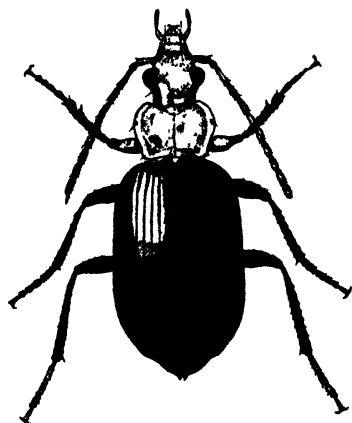


Fig. 12. *Colpodes lautulus* sp. n.

*Head* small, convex, eyes moderately prominent, hind supraorbital at a little distance from eye and rather behind eye level, frontal foveæ small and rounded, antennæ stout, reaching basal fourth of elytra, surface smooth, impunctate. *Prothorax* moderately convex, subcordate, a fourth wider than head and a third wider than long, widest just before middle, base evidently wider than apex, sides narrowly bordered, reflexed, moderately rounded and faintly sinuate before base, front seta within the margin at widest point, hind one just in front of the angle, hind angles reflexed, a little obtuse but fairly sharp; median line fine, connecting the transverse impressions, which are fairly deep, as are the basal foveæ, surface impunctate, but uneven along the base and in the lateral channels. *Elytra* convex, subovate, three fourths wider than prothorax, two thirds longer than wide, shoulders rather prominent, slightly though widely emarginate behind, with a sharp spine at apex of each; striæ fine, impunctate, 7 a little deeper near apex, intervals flat, 3 with three well marked pores, surface impunctate, a depression on each side of disk at apical third. Microsculpture of the elytra formed by fine, very wide meshes; none visible on head or prothorax, except traces on sides of latter. Underside impunctate, metepisterna twice as long

as wide. Joint 4 of protarsi moderately bilobed, in the meso- and metatarsi obliquely truncate and only slightly emarginate, meso- and metatarsal joints moderately bisulcate, joint 5 glabrous beneath.

In size and form almost exactly resembling *C. smaragdipennis* Chaud., but the pale parts are all much darker and the tibiæ and tarsi piceous or black. I saw the type of *smaragdipennis* some years ago at Rennes, but the specimen I have now before me was acquired recently, and I have not therefore had the opportunity of making a comparison. It is possible that the new species may prove to be no more than a colour variety of *smaragdipennis*.

Kenokok 11 ex. I have found three examples, also taken by Mr. Pendlebury, and now in the collection of the F.M.S. Museums at Kuala Lumpur. Two of these are labelled "Pahang: Cameron's Highlands, No. 4 Camp, 4,800 feet, June 18, 1923," and the third one "Pahang: Sungai Ringlet, 3,500 feet, March 10, 1925." In the Buitenzorg Museum is a single example from Java, labelled "Tjibodas, 1400 m., viii, 1921," which, although the elytra have hardly a trace of blue about them, I think belongs to the same species.

*Colpodes fuscus* sp. n. [Fig. 13].

Length: 11.5–12 mm. Width: 3.8–4.1 mm

Piceous, head and prothorax shiny, elytra sericeous; lateral margins of prothorax, border of elytra, palpi, antennæ, tibiæ, and tarsi more or less ferruginous.

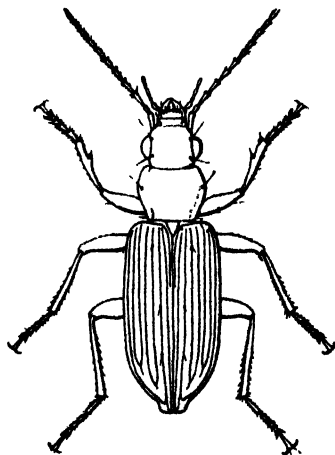


Fig. 13. *Colpodes fuscus* sp. n.

*Head* moderately convex, neck lightly constricted, eyes large and prominent, hind supraorbital large, not far from eye, frontal foveæ very shallow, antennæ reaching basal fourth of elytra, surface smooth and impunctate. *Prothorax* moderately convex, subquadrate, slightly wider than head and also slightly wider than long, widest just before middle, extremities truncate, base with its sides a little oblique close to the angles, slightly wider than apex, sides unbordered, reflexed, gently rounded in front and faintly sinuate before base, front lateral seta at widest point, hind one on the angle, hind angles a little obtuse and reflexed; median line extremely fine, transverse impressions and basal foveæ all fairly deep, the last named diverging in front and continuing forwards on each side as a faint impressed line, parallel with sides, nearly to front angles, surface a little uneven, but impunctate. *Elytra* depressed, elongate-quadrate, nearly twice as wide as prothorax, three fourths longer than wide, shoulders square, sinuate near and with a suggestion of a mucro at apex; striæ fine, vaguely and minutely crenulate, 1 arising in an umbilicate pore, only 1-2 and 7-8 reaching apex, 7 and 8 deeper than the others behind, a fairly long scutellary stria present; intervals flat, 8 very narrow and a little convex near apex, 3 with three conspicuous pores, surface sericeous, impunctate, only slightly uneven. Microsculpture of the elytra very conspicuous, formed by a reticulation of isodiametric meshes, that of the head and prothorax obsolete. Underside uneven, impunctate; metepisterna nearly twice as long as wide; last ventral segment ♀ with two marginal setæ on each side. Meso- and metatarsal joints deeply bisulcate; inner lobe longer than outer one in joint 4 of protarsi, but outer lobe longer than inner one in meso- and metatarsi; joint 5 very long and slender, glabrous beneath.

In shape rather like the Japanese *C. limodromoides* Bates, but otherwise dissimilar. The elongate form, flat elytra, with their dull sericeous surface and conspicuous isodiametric microsculpture will render the species easily recognizable.

Marei Parei, 2 ex. ♀ ♀.

*Colpodes klossi* sp. n. [Fig. 14].

Length: 9-10 mm. Width: 3.4-4 mm.

Black, shiny, elytra somewhat iridescent; palpi, antennæ (joints 1 to 3 generally darker than the rest), tibiæ, tarsi,



explanate margin of prothorax, and border of elytra brown to piceous.

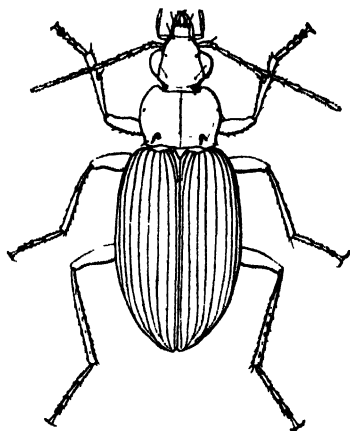


Fig. 14. *Colpodes klossi* sp. n.

*Head* convex, neck a little constricted, eyes rather large and prominent, hind supraorbital placed at some distance from eye, frontal foveæ short but moderately impressed, antennæ barely reaching basal fifth of elytra, surface smooth and impunctate. *Prothorax* moderately convex, barely a half wider than head, a little more than a half longer than wide, widest at about middle, base truncate, its sides oblique, apex a little emarginate, sides unborded, rather widely explanate and reflexed, more widely behind, evenly rounded, without sinuation, front lateral seta a little removed from margin, hind one just within the angle, hind angles obtuse, reflexed, and a little rounded; median line fine, transverse impressions moderately deep, basal foveæ deep, rounded, surface impunctate and practically smooth. *Elytra* moderately convex, ovate, two thirds wider than prothorax and as much longer than wide, shoulders rather square, a distinct emargination behind, inner three intervals on each side subtruncate at apex; striæ fine and very lightly impressed, faintly and minutely crenulate, 1 arising in a minute umbilicate pore, all deeper near apex and 8 moderately deep throughout, scutellary striole rather slight; intervals almost flat, except close to apex, 3 with three fairly large pores, surface impunctate, only slightly uneven, without depressions. The microsculpture of the elytra consists of extremely fine transverse lines, hardly forming meshes; on the prothorax these lines are less fine, but fainter, very wide transverse meshes being visible at the

sides; on the head none is visible. Underside impunctate; metepisterna twice as long as wide; last ventral segment ♂ with a single seta, ♀ with 2 marginal setæ on each side. Meso- and metatarsal joints bisulcate and with the outer lobe in joint 4 longer than the inner one, joint 1 of protarsi also lightly bisulcate; joint 5 long and slender, glabrous beneath.

The species is not unlike *C. lafertei* Montr., from New Caledonia and eastern Australia. The size is about the same, but the elytra, instead of being æneous, are subiridescent black. The head is not dissimilar, but the prothorax is not quite so wide, the front angles project a little forward, the sides more strongly rounded and more reflexed; the elytra are similarly striate on disk, but more deeply at apex, the surface smoother and more polished.

Kamborangah, 13 ex.; Lumu Lumu, 22 ex.; Tenompok Pass, 1 ex.; Marei Parei, 4 ex.

***Colpodes porphyrodes* sp. n. [Fig. 15].**

Length: 8-10 mm. Width: 3.4-3.7 mm.

Black, shiny, elytra very dark purple; palpi, joints 1 to 3 of antennæ, and tarsi more or less piceous, rest of antennæ testaceous.

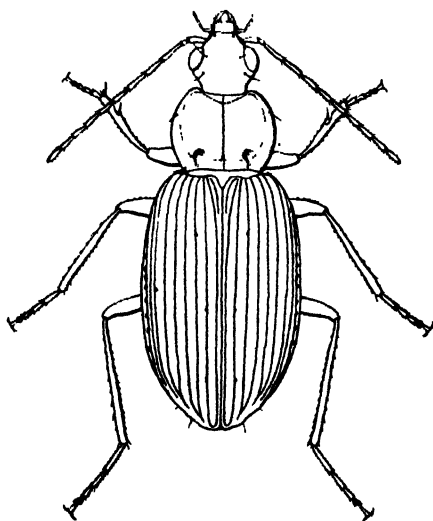


Fig. 15. *Colpodes porphyrodes* sp. n.

Head small, convex, neck slightly constricted, eyes not prominent, hind supraorbital placed behind the level of and at some distance from eye, frontal foveæ short, not deep, with a pore in each just behind clypeal suture, antennæ reaching basal fifth of elytra, surface smooth and impunctate. *Prothorax* moderately convex, about a half wider than head and as much wider than long, widest at about middle, base truncate, its sides a little oblique, apex slightly emarginate, narrowly bordered, a little narrower than base, sides unbordered, moderately explanate and reflexed, more widely behind, rounded in front, straight behind, front lateral seta a little removed from margin, hind one on the angle, hind angles obtuse, reflexed, but not much rounded; median line and transverse impressions all moderately deep, basal foveæ deep, rounded, surface impunctate, a little uneven along sides and base. *Elytra* moderately convex, ovate, two thirds wider than prothorax and about as much longer than wide, shoulders rather square, a slight emargination on each side behind a wide re-entrant angle at apex; striæ rather fine, but very clean cut, impunctate (though with traces of fine crenulation), 1 and the fairly long scutellary stria both arising in an umbilicate pore, 8 a little deeper than the rest; intervals flat, 3 with three pores, at apex all the inner ones slightly concave, 1 narrow and sulcate, 8 reduced to a very fine carina behind and subsulcate throughout, 9 and lateral channel both finely sulcate, so that the margin appears triply bordered, surface impunctate and nearly smooth, with a faint depression on each side of disk behind. The microsculpture on the elytra consists of very fine oblique lines, forming very wide meshes; on the prothorax the meshes are only moderately wide, and on the head they are isodiametric but very faint. Underside impunctate but uneven; metepisterna nearly twice as long as wide; last ventral segment ♂ with a single marginal seta on each side. All the tarsal joints bisulcate, those of the protarsi rather faintly; joint 5 glabrous beneath.

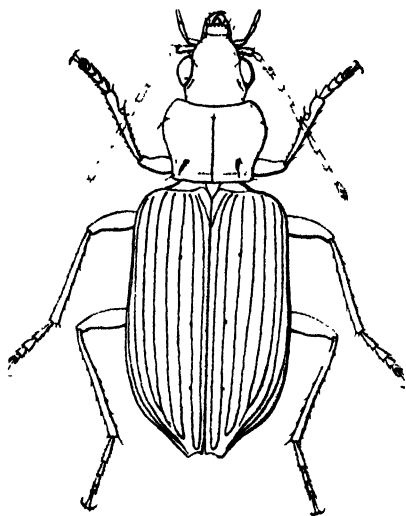
The sculpturing of the elytra at apex resembles that of the Sumatran *C. modiglianii* Andr., but otherwise the species is more nearly allied to *lafertei* Montr. The colour is different for the antennæ are chiefly testaceous and the elytra are very dark purple, but the dimensions are similar. The eyes are flatter, the prothorax smooth, with less obtuse hind angles; the elytral striæ are more clearly cut, the intervals flat, the dorsal pores smaller, and the sides and apex presenting the unusual sculpturing described in the text.

Tenompok Pass 1 ex. ♂; Lumu Lumu, 1 ex. ♂.

***Colpodes humilis* sp. n. [Fig. 16].**

Length: 8 mm. Width: 3 mm.

Piceous, shiny: palpi, antennæ (joints 1 and 3 piceous in the middle), reflexed lateral margins of prothorax, femora (except close to apex), and tarsi ferruginous.

Fig. 16. *Colpodes humilis* sp. n.

*Head* convex, neck slightly constricted, eyes large and rather prominent, hind supraorbital not far removed from eye, frontal foveæ shallow, a slight fovea on each side of vertex, antennæ reaching basal third of elytra, surface impunctate. *Prothorax* convex, cordate, a fourth wider than head, nearly a third wider than long, widest before middle, extremities truncate, base wider than apex, which is narrowly bordered, sides unbordered, rather narrowly reflexed in front, more widely behind, rounded in front, sinuate well before base, front pore in the lateral channel, hind one (seta missing) just before the angle, hind angles right, reflexed, and moderately sharp; median line very fine, transverse impressions moderately deep, basal foveæ deep, continued forward some little way parallel with sides, surface impunctate, nearly smooth. *Elytra* moderately convex, elongate, nearly twice as wide as prothorax and four fifths longer than wide, widest behind middle, shoulders rather square, sides with a marked sinuation behind, a wide re-entrant angle at apex; striæ clearly cut but not deep, impunctate, slightly deeper at apex, a fairly long scutellary stria; intervals nearly flat, 3 with three dorsal pores, surface smooth and impunctate, a slight depression on each side of disk just before middle. Microsculpture of elytra formed by meshes on average much wider than long; none visible on disk of

prothorax or head, but faint meshes can be seen on margins, a little wider than long on the former, isodiametric on the latter. Underside impunctate; metepisterna nearly twice as long as wide; last ventral segment ♀ with two marginal setæ on each side. Meso- and metatarsal joints lightly bisulcate; joint 1 of protarsi feebly bisulcate; joint 4 deeply lobed, the outer much longer than the inner lobe in the two hind pairs of legs; joint 5 glabrous beneath.

I know of no Malaysian species resembling this one, but it is not unlike the Singhalese *C. iteratus* Bates. It is a little larger and wider, the tibiæ are dark, and so is the elytral border. The eyes are much more prominent, the sides of the prothorax more strongly sinuate behind and the angles rectangular; the elytra have squarer shoulders, the striæ are not so fine, the posterior sinuation on each side is deeper, and there is a wide re-entrant angle at apex.

Kenokok, 1 ex. ♀.

*Colpodes æneolus* sp. n. [Fig. 17].

Length: 8–9 mm. Width: 2.9–3.1 mm.

Black, shiny, elytra brassy purple, sometimes one colour predominating, sometimes another, but generally brassy on disk and purple close to base and apex, tibiæ piceous, palpi, antennæ, tarsi, and lateral margins of prothorax rather dark ferruginous.

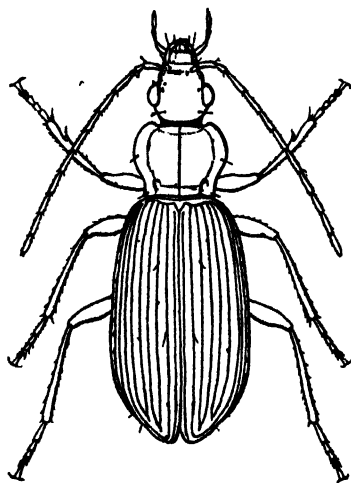


Fig. 17. *Colpodes æneolus* sp. n.

*Head* convex, neck evidently constricted, eyes moderately prominent, hind supraorbital placed behind the level of and at some distance from eye, frontal foveæ moderately deep, uneven, reaching mid-eye level, a transverse impression behind clypeal suture, and generally further vague impressions behind it, antennæ extending

rather beyond middle of elytra, surface impunctate. *Prothorax* cordate, moderately convex, a sixth wider than head, very little wider than long, widest before middle, base truncate, somewhat wider than apex, which is narrowly bordered and faintly emarginate, sides narrowly bordered, slightly explanate, gently rounded in front, sinuate at basal third, front lateral seta just within the border, hind one on the angle, hind angles right, sharp, a little reflexed, sometimes projecting a little laterally; median line very fine, transverse impressions fairly deep, basal foveæ deep, uneven, at first converging, then diverging and continuing a long way forward, parallel with sides, surface impunctate, but rather uneven along sides and base. *Elytra* convex, ovate, four fifths wider than prothorax, three fifths longer than wide, border forming an obtuse angle at shoulder, a slight sinuation behind and a small re-entrant angle at apex; striæ wide and deep, with traces of very fine crenulation, 3 and 4 joining somewhat before apex and 5 and 6 a little further back, scutellary striole short; intervals only moderately convex, the outer narrower than the inner ones, especially 7 and 8 towards base, 2 a little wider than the others, 3 with three pores, the hind one not very far from apex, surface smooth and impunctate, without depressions. The microsculpture on the elytra consists of transverse lines, not very closely placed, forming meshes on average two or three times as wide as long; on the prothorax the meshes are finer but fainter; on the head the meshes are isodiametric but barely perceptible. Underside impunctate; metepisterna about a half longer than wide; last ventral segment ♂ with one marginal seta, ♀ with two setæ on each side. Joint 1 of the metatarsi is outwardly sulcate, but otherwise the tarsal joints are not sulcate; joint 5 in all tarsi is glabrous beneath; joint 4 is very strongly bilobed in both pro- and mesotarsi.

I know of no nearly related species. The generic characters generally are those of *Colpodes*, the tooth of the mentum, though wide and a little sulcate, is not cleft, the fourth tarsal joint is bilobed, and the claws are smooth. The prosternal declivity, however, is carinate, and, if the usual importance is to be attributed to this character, it will be necessary to make a new genus for this insect somewhere in the neighbourhood of *Platyderus*. I am not satisfied, however, that the form of the prosternal process is in *Colpodes* a good generic character. It is true that Chaudoir, at least when writing his Monograph (1859), knew of no species in which the declivity was carinate; but species exist, e.g. *C. fryi* Bates, where there is a distinct, if short, carina. Here the carina is even more developed, and the prosternal process, viewed from beneath, ends in a short but sharp tooth. On the whole it seems

better to retain such species for the present in the genus *Colpodes* till the Malaysian fauna is better known.

Kamborangah, 8 ex.

*Colpodes rubescens* sp. n. [Fig. 18].

Length: 6 mm. Width: 2.2 mm.

Black beneath, head and prothorax black, with faint æneous reflections, elytra brassy, becoming reddish-purple at sides and especially behind, suture dark; palpi, antennæ, margin of prothorax (narrowly), tibiæ, and tarsi ferruginous, femora piceous.

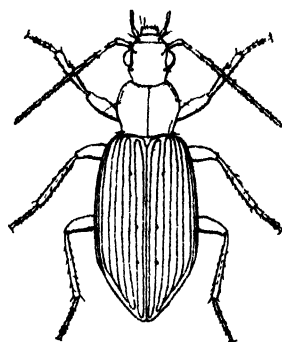


Fig. 18. *Colpodes rubescens* sp. n.

*Head* convex, neck slightly constricted, eyes moderately prominent, hind supraorbital at a little distance from eye and slightly behind hind eye level, frontal foveæ short and shallow, antennæ slender, reaching basal third of elytra, surface smooth and impunctate. *Prothorax* convex, subquadrate, a sixth wider than head and slightly less than a sixth wider than long, widest before middle, base slightly produced at middle, wider than apex, which is bordered, sides narrowly bordered and reflexed, gently rounded in front and equally gently sinuate behind, but straight for a short distance just behind front lateral pore, which is within the border at apical third, hind pore on the angle, hind angles right, fairly sharp, and a little reflexed; median line fine, transverse impressions slight, basal foveæ rather deep, directed first inwards, then a little outwards, surface smooth and impunctate, base somewhat uneven. *Elytra* convex, subovate, twice as wide as prothorax, a half longer than wide, widest behind middle, shoulders rather square, no sinuation behind, apex somewhat produced, and each elytron separately rounded; striæ fine, impunctate, very clearly impressed, 8 a little deeper than the rest, intervals flat, 3 with three small pores, the hindmost not very far from apex. Microsculpture of the elytra formed by very wide meshes; the prothorax with less wide but very faint meshes; the head with almost invisible isodiametric meshes. Underside impunctate, metepisterna nearly twice as long

as wide. Tarsal joints not grooved, joint 4 deeply bilobed, 5 glabrous beneath.

I know of no described species resembling this one, but its small size, narrow form, the rectangular hind angles of the prothorax, and the finely striate elytra will render it easily recognizable.

Lumu Lumu, 1 ex. ♂.

***Colpodes microps* sp. n.** [Fig. 19].

Length: 5.5-6 mm. Width: 2.2-2.4 mm.

Black, rather shiny: palpi and joints 1 to 3 of antennæ ferruginous, rest of antennæ, borders of prothorax and elytra, and legs dark ferruginous.

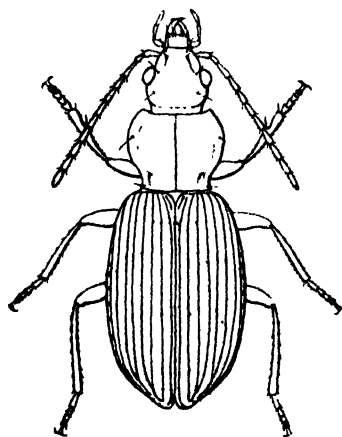


Fig. 19. *Colpodes microps* sp. n.

*Head* convex, constricted at some little distance behind eyes, which are very small but stand out from the head, hind supraorbital distant from and well behind hind eye level, frontal foveæ fairly deep, diverging behind and reaching front supraorbital, antennæ reaching basal fifth of elytra, surface smooth, impunctate, two slight foveæ on vertex. *Prothorax* convex, cordate, a fourth wider than head and as much wider than long, widest before middle, base truncate, as wide as apex, sides narrowly bordered and slightly explanate, rounded in front and sinuate at about a fifth from base, front seta within the border at a third from apex, hind one on the angle, hind angles right, sharp, and somewhat reflexed; median line and front transverse impression moderately deep, hind transverse impression very clearly marked, basal foveæ deep, rounded, adjoining the angles, surface impunctate, lightly transversely striate. *Elytra* convex, ovate, two thirds wider than prothorax, a little more than a fourth longer than wide, widest a little behind middle, no appreciable sinuation behind, extreme apex slightly truncate, without mucro; striæ rather lightly impressed, impunctate,



8 deeper than the rest, intervals moderately convex, 3 with three pores, surface impunctate. Microsculpture of the elytra formed by barely visible transverse lines (x80), which on the prothorax are less fine but extremely faint; on the head there are faint isodiametric meshes. Under-side impunctate; metepisterna about a half longer than wide; last ventral segment  $\delta$  with one marginal seta on each side. Tarsal joints with their upper surface alutaceous, not grooved; joint 4 deeply bilobed; joint 5 glabrous beneath.

The very small eyes are similar to those in *C. olearis*, but the seta on the hind angle of the prothorax and the less polished surface distinguish it from that species.

Pakka, 3 ex.  $\delta \delta$ .

*Colpodes asthenes* sp. n. [Fig. 20].

Length: 7-7 mm. Width: 2-2.4 mm.

Piceous, shiny: palpi, joints 1 to 3 of antennæ, tibiæ, and tarsi ferruginous, rest of antennæ, lateral margins of prothorax and elytra, femora, and apex of venter brown.

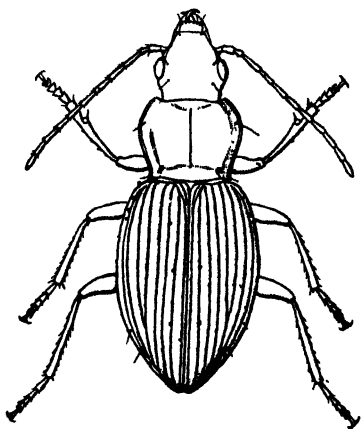


Fig. 20. *Colpodes asthenes* sp. n.

*Head* convex, neck slightly constricted, eyes small and not very prominent, hind supraorbital distant from and well behind hind eye level, frontal foveæ rather shallow, linear, distant from each other, the space between them convex, a short longitudinal carina on each side close to eye, a pair of shallow foveæ sometimes present on middle of front, antennæ reaching basal fourth of elytra, surface impunctate. *Prothorax* convex, cordate, a third wider than head, barely a sixth wider than long widest just before middle, base truncate, apex faintly emarginate, narrowly bordered, slightly narrower than base, sides narrowly bordered and reflexed, gently rounded in front and sinuate a little before base, front seta in the lateral channel, hind one on the angle, hind angles almost right, reflexed, and

rather sharp; median line fine on disk, deeper at extremities, front transverse impression shallow, hind one and basal foveæ fairly deep, the latter rounded, uneven, close to the angles, surface smooth and impunctate. *Elytra* convex, ovate, rather more than a half wider than prothorax and rather less than a half longer than wide, widest a little behind middle, posterior sinuation very slight, each elytron separately rounded; striæ moderately deep, hardly perceptibly crenulate, scutellary striole short but deep; intervals fairly convex, the inner a little wider than the outer ones, 1 very narrow behind, 3 with three rather conspicuous dorsal pores, surface smooth and impunctate, without depressions. Microsculpture of elytra consisting of very fine and closely placed lines, forming very wide meshes; none on the head and traces only on sides of prothorax. Underside impunctate; metepisterna not much longer than wide; last ventral segment ♂ with 1 marginal seta, ♀ with 2 setæ on each side. Joint 1 of meso- and metatarsi with a slight outer sulcus; joint 4 deeply bilobed, the outer much longer than the inner lobe in the two hind pairs of legs; joint 5 glabrous beneath.

The species is somewhat like the Singhalese *Anchomenus illocatus* Walk., being about the same size, but with darker legs and lighter antennæ. Head larger and with a neck constriction, eyes smaller; prothorax wider, sides more sinuate behind, so that the hind angles are much sharper; elytra more pointed behind and with deeper striæ; meso- and metatarsal joints not sulcate.

Kamborangah, 8 ex.

***Colpodes abruptus* sp. n.** [Fig. 21].

Length: 12–13 mm. Width: 4.75–5.25 mm.

Black; elytra steel blue; tarsi, joints 5 to 11 of antennæ, and apex of palpi more or less dark rufous; tarsal joints clothed with golden hairs.

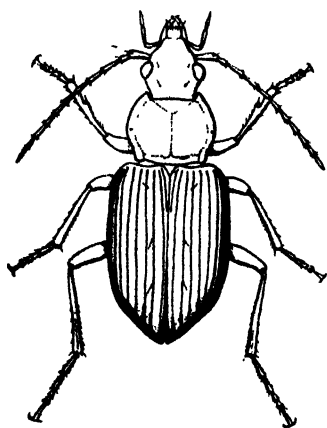


Fig. 21. *Colpodes abruptus* sp. n.

Head convex, neck unconstricted, eyes neither large nor prominent, hind supraorbital behind the level of and widely distant from eye, frontal foveæ obsolete, antennæ barely reaching basal fifth of elytra, surface smooth and impunctate. *Prothorax* convex, a third wider than head, barely a fourth wider than long, widest at middle, base truncate, its sides a little oblique, slightly wider than apex, which is narrowly bordered, truncate at middle, its sides very oblique, so that the front angles, which are only a little rounded, project strongly forward, sides unbordered, widely explanate and moderately reflexed, front lateral pore very small, placed on the explanate margin at about a half (no setæ visible on any of the specimens), none behind, where there is a slight sinuation on each side just before the hind angles, which are obtuse and reflexed; median line fine, front transverse impression visible only at middle, hind one fairly deep, basal foveæ very deep, surface smooth, a few vague, minute punctures on the explanate sides. *Elytra* ovate, somewhat depressed, a half wider than prothorax and two thirds longer than wide, shoulders square, sides slightly dilated behind, apex rather pointed, without mucro, a slight sinuation on each side; striæ fairly deep, impunctate, 1 arising in an umbilicate pore, a slight scutellary stria present, intervals rather flat, more convex at sides, where 6 widens at the expense of 7, 3 with three small pores, the first near base, the second at a half, the third at four fifths, marginal series widely spaced at middle, surface impunctate, very uneven, a slight transverse depression across middle, apical third of disk flattened out, the surface behind it falling abruptly, almost vertically, towards apex. Microsculpture of the elytra formed by extremely fine transverse lines, forming very wide meshes; that of the prothorax similar but less fine, the meshes not so wide; on the head the meshes are isodiametric. All the episterna and the sides of the metasternum finely, though lightly punctate, metepisterna less than twice as long as wide; last ventral segment  $\delta$  with one marginal seta,  $\eta$  with two setæ on each side. Meso- and metatarsal joints slightly bisulcate, joint 5 glabrous beneath throughout.

The form of the prothorax, with its deeply emarginate apex, protruding front angles, and widely explanate sides, together with the abrupt declivity at the apex of the elytra render this species a very distinct one; nothing at all like it has hitherto been described from South East Asia.

Kamborangah, 4 ex.

*Colpodes apotomus* sp. n.

This species has many features in common with *Colpodes abruptus*, described above; the size and colour are about the same, except that the elytra are violet. The head does not differ, the hind supraorbital being similarly remote

from the eye. In the prothorax the base is truncate, the apex only slightly emarginate, so that the front angles do not project far forward; the sides are similarly unbordered, unisetose, and explanate, but not reflexed and without any sinuation behind, the hind angles strongly rounded and hardly apparent; the hind transverse impression and basal foveæ are not so deep. The elytra are a little longer and less pointed at apex, with a suggestion of an obtuse mucro; the striæ and intervals are nearly similar, the former a little shallower towards sides and apex, and the pores on interval 3 are similarly placed, but interval 6 does not widen at middle; the surface is less evidently undulate and the apical third of disk less conspicuously flattened, but the abrupt apical declivity is similar. The microsculpture differs on the prothorax only, where the transverse lines are less closely placed and the meshes less wide. The underside is impunctate.

Tenompok Pass 2 ex. ♂♂.

*Colpodes olearis* sp. n. [Fig. 22].

Length: 6.5-7 mm. Width: 3-3.4 mm.

Black, very shiny, slightly iridescent, elytra sometimes with a vague æneous tinge; palpi ferruginous, antennæ, tibiæ, and tarsi dark ferruginous, femora brown.

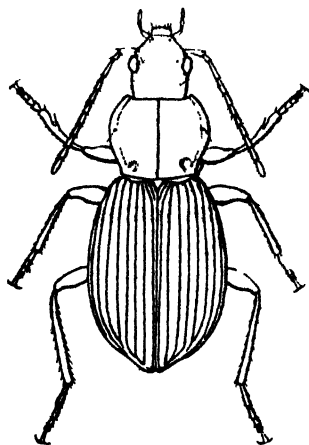


Fig. 22. *Colpodes olearis* sp. n.

*Head* convex, not constricted behind, eyes very small but moderately prominent, hind supraorbital distant from and well behind hind eye level, frontal foveæ slight and shallow, bounded outwardly by a short oblique ridge on each side, antennæ not reaching far beyond base of prothorax, surface impunctate. *Prothorax* convex, subcordate, a half wider than head and about a fifth wider than long widest a little before middle, base with its sides oblique, apex truncate, a little narrower than base, sides narrowly bordered and reflexed, somewhat explanate behind, gently rounded in

front faintly sinuate before base, front seta in the lateral channel at widest part, hind one wanting, hind angles reflexed, a little obtuse and rounded; median line rather fine, transverse impressions slight, basal foveæ fairly deep, diverging in front, surface smooth and impunctate. *Elytra* convex, ovate, rather more than a half wider than prothorax and as much longer than wide, widest very slightly behind middle, sides faintly sinuate near apex, no mucro; striæ very clearly but rather lightly impressed, 8 deeper than the rest, scutellary striole short; intervals very slightly convex, 1 narrower than the rest, no dorsal pores, surface smooth and impunctate, without depressions. The microsculpture of the prothorax and elytra consists of transverse lines, so fine and closely placed as to be barely visible; on the head some isodiametric meshes are faintly visible to margins. Underside impunctate; metepisterna only a little longer than wide; last ventral segment ♀ with 2 marginal setæ on each side. Tarsal joints with their upper surface alutaceous, not grooved; joint 4 moderately bilobed; joint 5 glabrous beneath.

The species is not much like any other known to me, but the combination of very small prominent eyes, the absence of hind lateral seta on the prothorax; and the highly polished surface will render it easy to identify.

Kamborangah, 3 ex. ♀ ♀; Pakka, 1 ex. ♀.

*Colpodes sandalodes* sp. n. [Fig. 23].

Length: 7.5 mm. Width: 3 mm.

Rather dark ferruginous, the palpi, antennæ, tibiæ, tarsi border and base of prothorax, and border and suture of elytra all lighter, elytra ferruginous æneous apical two thirds of femora piceous.

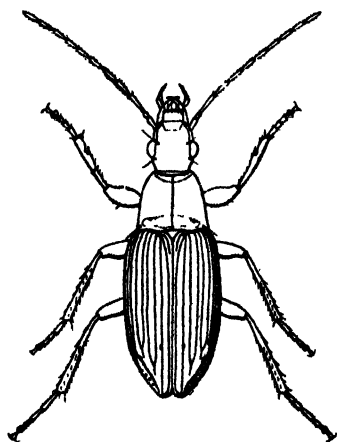


Fig. 23. *Colpodes sandalodes* sp. n.

*Head* rather flat, neck moderately constricted, eyes prominent, hind supraorbital at a little distance from eye and rather behind hind eye level, frontal foveæ short and shallow, a V-shaped impression on middle of front, antennæ very slender, reaching basal third of elytra, surface smooth and impunctate. *Prothorax* moderately convex, trapezoidal, nearly a half wider than head a third wider than long, widest at base, which is faintly bisinuate and quite a third wider than apex, sides narrowly bordered, diverging from apex, at first gently rounded but nearly straight behind, front pore and seta wanting, hind one on the angle, which is right, moderately sharp, and strongly reflexed; median line extremely fine, transverse impressions strongly marked, basal foveæ rounded, small but deep, close to the angles, surface impunctate but rather uneven. *Elytra* convex, oval, two thirds wider than prothorax, rather more than a half longer than wide, base exactly as wide as base of prothorax, sharply dilated behind shoulders, a small sinuation on each side just before apex, where each elytron is separately rounded; striæ very fine, impunctate, 7 a little deeper near apex, intervals flat, slightly concave towards apex, 3 with a single dorsal pore at a fifth from apex, surface smooth and impunctate, a small knob on each side towards apex, where striæ 5 and 6 join. Microsculpture of elytra formed by meshes about twice as wide as long; on the prothorax the meshes are smaller and less distinct; on the head there are very small, but very distinct, isodiametric meshes. Underside impunctate, metepisterna twice as long as wide. Tarsi slender, joint 1 of the two hind pairs of legs moderately bisulcate, 5 glabrous beneath.

I know of no other species at all resembling this one.

Kenokok, 1 ex. ♂ (probably immature).

### Genus *Arhytinus* Bates.

Ann. Soc. Ent. France 1889, p. 278; id. Ann. Mus. Civ.

Gen., xxxii, 1892, p. 378.

To complete the description of this genus, which was drawn up on 2 ♀ specimens, the following particulars may be added. Form short and compact, body winged. *Head* with the frontal foveæ punctiform and placed at the ends of the faint clypeal suture, clypeus bisetose, eyes adjacent to buccal fissure, two supraorbital pores adjoining eyes, the front one very large, ligula wide, bisetose, truncate at apex, paraglossæ adnate, narrow, extending beyond ligula, maxillæ slender, sharp, hooked at apex and rather sparsely furnished with stout bristles. *Prothorax* subcordate, its sides bisetose. *Elytra* with a basal border, 9-striate, a scutellary stria between stria 1 and suture, no inner plica. Prosternal process glabrous, almost vertical behind.

the declivity with a blunt keel. Last ventral segment ♂ with a single marginal seta, ♀ with two setæ on each side. Meso- and metatarsal joints bisulcate, joint 1 of the metatarsi as long as the next three taken together, joint 5 glabrous beneath; protarsi ♂ with the first three joints moderately dilated and furnished beneath with two rows of large white scales.

In the original description there is some confusion regarding the setiferous pores on the head; the pores in front are in fact the clypeal pores, the hind pairs adjoining the eye being the normal supraorbital pores.

**Arhytinus bembidioides** Bates.

Ann. Soc. Ent. France 1889, p. 279 (not 379, as printed).

Length: 6-7.5 mm. Width: 3-3.4 mm.

Black, elytra slightly iridescent: palpi, antennæ, legs, propleura, and border of both prothorax and elytra ferruginous.

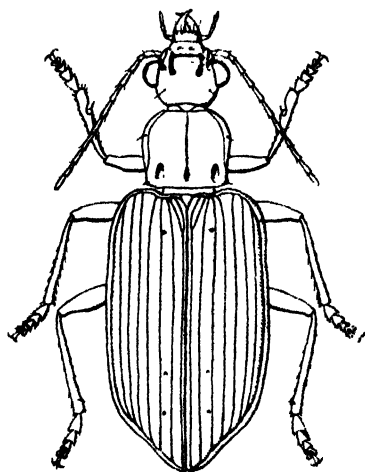
*Head* convex, smooth, dull, frontal foveæ punctiform, eyes rather prominent, antennæ somewhat thick, reaching basal fourth of elytra, joint 2 about a half, and 3 about two thirds as long as 1, the rest equal to 1. *Prothorax* about a third wider than head, and nearly a half wider than long, widest a little before middle, base unbordered, its sides oblique, a little wider than apex, which is narrowly bordered and a little emarginate, sides narrowly bordered, rounded in front, nearly straight behind, though faintly sinuate before the angles, front lateral seta at a third from apex, hind one in the angle, which is obtuse but hardly rounded, and only slightly reflexed; median line and transverse impressions all slight, basal foveæ large, rounded, and moderately deep, surface smooth, basal area uneven, very finely and vaguely punctate. *Elytra* moderately convex, a half wider than prothorax and as much longer than wide, shoulders square, hardly perceptibly dilated behind, not sinuate before apex; striæ fine, minutely punctate, much deeper close to apex, none quite reaching base, all reaching apex, except 5 and 6, which join a little before it, 8 rather deep at both extremities; intervals faintly convex on disk, strongly convex at apex, marginal series interrupted at middle, the pores large and rather irregular. Microsculpture of elytron formed by exceedingly fine, closely placed, transverse lines; on the prothorax these lines are less fine and form very wide meshes; the microsculpture of the head is very conspicuous and is formed by isodiametric meshes.

At first sight this insect strongly recalls a dark *Badister*, e.g. *B. sundaicus* Andr., but both mandibles and clypeus are normal.

***Dinopelma quadratum* sp. n. [Fig. 24].**

Length: 9 mm. Width: 3.75 mm.

Piceous beneath, black and shiny above, elytra with a faint æneous gloss; palpi, antennæ, tarsi, and explanate margin of elytra (partly by translucence) dark ferruginous.

Fig. 24. *Dinopelma quadratum* sp. n.

*Head* wide, depressed in front, contracted behind, with a deep neck constriction, genæ conspicuous, slightly curved, as long as eyes, frontal foveæ very deep, reaching mid-eye level, joined in front by the clypeal suture, bounded externally by a well marked carina, between which and eye is the deep front supraorbital pore, a slight depression on each side between, and another behind the foveæ, a small depression also on vertex, eyes hemispherical, antennæ reaching rather beyond base of prothorax. *Prothorax* convex, subquadrate, barely wider than head, but a little wider than long, sides finely bordered, rather strongly rounded in front, where the angles adjoin neck, thence gently rounded and faintly sinuate before base, moderately explanate, with a fine longitudinal, though slightly sinuate sulcus running along the inner margin of the explanate area from near front angle to a point on the lateral border about a fourth from base, a seta at widest part, a little before middle, and another on hind angle, hind angles sharp, but slightly obtuse; median line deep, not reaching front margin, front transverse impression slight, hind one fairly deep, basal foveæ deep, uneven, surface finely transversely striate. *Elytra* convex, quadrate, more than twice as wide as prothorax, not quite two thirds longer than wide, shoulders square, the border hardly angulate, sides parallel, emarginate on each side before apex; striæ very fine, minutely crenulate, deeper close to apex, intervals flat, the



inner ones subcarinate on outer margin close to apex, 5 wider than the other intervals close to base, 3 with three conspicuous pores, near base, at two thirds, and near apex, surface very smooth. Microsculpture of head and elytra formed by isodiametric meshes, much finer on the former than the latter; on the prothorax the meshes, are very fine and strongly transverse. Underside impunctate, metepisterna more than twice as long as wide, last ventral segment  $\delta$  with a single marginal seta on each side.

A little smaller than *D. plantigradum* Bates, and not entirely black. Head with much more prominent eyes; prothorax smaller, narrower, less explanate at sides, with a much deeper median line and longer lateral carinæ; elytra with rather more parallel sides, even more finely striate, and without pore on interval 5.

Lumu Lumu, 1 ex.  $\delta$ ; Kamborangah, 1 ex.  $\delta$ .

***Dinopelma angustum* sp. n.** [Fig. 25].

Length: 9 mm. Width: 3 mm.

Black, shiny: palpi, antennæ, apical half of tibiæ, tarsi, and apex of venter reddish-brown.

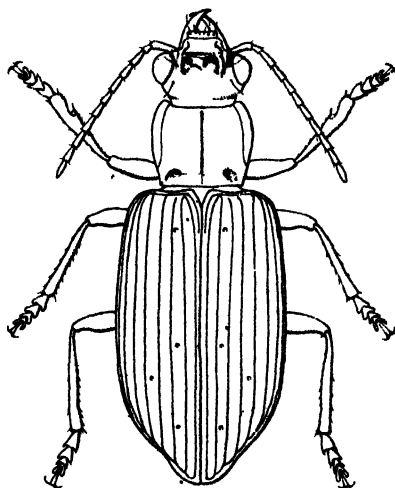


Fig. 25. *Dinopelma angustum* sp. n.

*Head* fairly wide, depressed in front, contracted behind, with a deep neck constriction, frontal foveæ very deep, curving a little inwards, joined in front by the clypeal suture, behind which and between the foveæ are some irregular transverse impressions, eyes prominent, antennæ imperfect, but certainly reaching base of prothorax. *Prothorax* slightly convex, subquadrate, barely wider than head and very little wider than long, sides very finely bordered, gently and nearly evenly rounded from apex to base, rather widely explanate, more widely behind, a fine longitudinal,

though slightly sinuate carina running down the middle of the explanate area from the front margin, just within the angle, to a point on the lateral margin a little in front of the hind angle, no visible lateral pores or setæ, hind angles very slightly obtuse, but quite sharp; median line fairly deep at middle only, front transverse impression very slight, hind one more marked, basal foveæ fairly deep, rounded, adjoining the angles, surface finely transversely striate, sides and especially basal foveæ finely and vaguely rugose-punctate. *Elytra* rather flat, fully a half wider than prothorax, two thirds longer than wide, shoulders square, the border forming a very obtuse angle, sides parallel, a little emarginate on each side before apex; striae moderately impressed, very finely crenulate, intervals flat, 3 with three conspicuous pores, near base, just behind a half, and at four fifths, 5 with a pore at two thirds, surface very smooth. Microsculpture of elytra formed by isodiametric meshes, hardly any visible elsewhere. Underside impunctate, metepisterna very narrow, two and a half times as long as wide, last ventral segment  $\delta$  with one marginal seta,  $\varphi$  with two setæ on each side.

Smaller, narrower, and flatter than *D. plantigradum* Bates. Head with much shorter and quite inconspicuous genæ; prothorax with the sides evenly rounded, the slight, lateral, longitudinal ridge and sulcus represented here by a conspicuous carina; elytra longer, with parallel sides, moderately deep striae, and larger pores on interval 3.

Kenokok, 1 ex.  $\delta$ . I have also a rather maimed  $\varphi$  example in my own collection; this, too, came from Mt. Kinabalu, and was received some years ago from Mr. T. G. Sloane, in whose collection the species is also represented.

*Desera crassa* sp. n. [Fig. 26].

Length: 9-11 mm. Width: 2.6-3 mm.

Blue: basal four fifths of antennal joint 1 and the greater part of joint 3, apex of femora, tibiæ, and tarsi black; palpi, rest of antennæ and femora ferruginous.

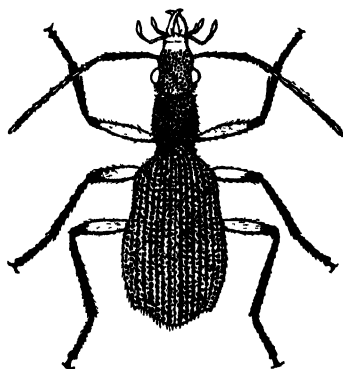


Fig. 26. *Desera crassa* sp. n.

Head moderately convex, twice as long as wide (including mandibles), eyes moderately convex, genæ fairly conspicuous, clypeus smooth and impunctate, surface otherwise coarsely and somewhat confluent punctate. *Prothorax* a little narrower than head, barely a half longer than wide, moderately convex, constricted at a third from base, sides with a rather indefinite border, nearly straight in front, sinuate at the constriction, a seta (usually invisible) at about middle, hind angles somewhat indefinite, but projecting a little laterally; median line rather fine but distinct, transverse impressions obsolete, basal foveæ fairly deep, adjacent to sides, continued forward beyond middle; surface more densely and more finely punctate than the head. *Elytra* convex, nearly two and a half times as wide as prothorax, four fifths longer than wide, dilated at a third from base, and thence rounded to apex, widest at a third from apex, which is truncate, with a sharp tooth at the outer angle of the truncature; deeply punctate-striate, intervals convex, punctate but not densely, the punctures mostly smaller than those on head and prothorax, though a few larger punctures are mingled with them.

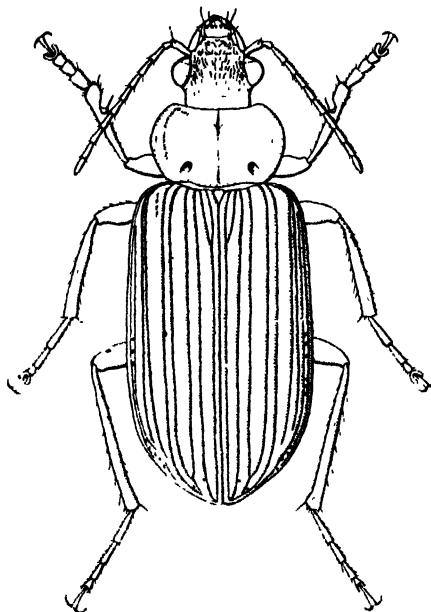
Compared with *unidentata* MacL., the head and prothorax are as coarsely but rather less closely punctate; the elytral intervals are much more convex, more coarsely and less closely punctate; the apical sixth of the femora is black, whereas in *unidentata* only the extreme apex is slightly fuscous. Two Malaysian species of *Desera* are unknown to me in nature, viz. *parallela* Chaud., in which the elytra are parallel, and *ternatensis* Chaud., which is said to be olive-green, whereas all the specimens now before me are blue, rarely with a faint tinge of green.

Kiau, 1 ex. I have also specimens in my own collection labelled "Kinabalu," and have seen others in Mr. M. Liebke's collection; examples labelled "North East Borneo," probably also from Kinabalu, are in the collections of the Dresden Museum and Mr. M. Bänninger. In the Amsterdam Zoological Museum there are specimens from Boekit Gabah (*H. Lucht*), on the South West Coast of Sumatra.

**Orthogonius monolophus** sp. n. [Fig. 27].

Length: 15-18 mm. Width: 5.75-6.75 mm.

Black or piceous; palpi, antennæ, and legs medium to dark brown.

Fig. 27. *Orthogonius monolophus* sp. n.

*Head* convex, irregularly and moderately deeply rugose-striate, frontal foveæ very small, clypeal suture fairly deep, the surface a little smoother behind it, clypeus with two small raised areas and a short longitudinal sulcus between them, eyes large and prominent, antennæ short and stout, ligula bisetose. *Prothorax* convex, quite a half wider than head, nearly three fourths wider than long, base bisinuate, strongly reflexed, hardly wider than apex, all the angles strongly rounded, sides unbordered, evenly rounded, moderately explanate, and hardly reflexed; median line fine, both transverse impressions deep, basal foveæ rounded, hardly deeper than the hind transverse impression which joins them, surface impunctate, vaguely and irregularly striate. *Elytra* rather flat, a half wider than prothorax and a little more than two thirds longer than wide, border rounding shoulder and reaching a point midway between striae 4 and 5, shoulders square, sides parallel, apex rounded, sutural angle minutely but sharply dentate; striae moderately deep, very finely crenulate; intervals nearly flat and approximately equal, though the even ones widen out a little near base, where 6 has a short, subpunctate, linear impression down the middle, 7 very narrow and almost carinate, but

widening and becoming flat behind, where it is hardly narrower than the other odd intervals 3 with a pore near base and another close to apex, odd intervals bearing a few minute pores, visible chiefly near apex, surface generally smooth and faintly sericeous. The microsculpture of the elytra is formed by meshes, which, on average, are considerably wider than long; on the prothorax it is similar, but finer; on the head the meshes are isodiametric and very fine. Underside impunctate, prosternal process finely bordered at sides only; protibiæ only slightly produced externally at apex, mesotibiæ slightly dilated, metatibiæ with short sharp spurs, all tarsi with joint 4 bilobed and the claws shortly pectinate.

It will be seen that this species belongs to section B. b. *B* of Chaudoir's Monograph (Ann. Soc. Ent. Belg. xiv, 1871, p. 115), of which all the species hitherto described are African. The subcarinate seventh interval of the elytra is sufficient to distinguish the species from its eastern congeners, but other and at present undescribed species, presenting the same character, are known to me, both from Borneo and from the Malay States.

Kenokok, 2 ex. ♂ ♂.

*Pericalus cordicollis* sp. n. [Fig. 28].

Length: 12 mm. Width: 4.6 mm.

Black: joints 4 to 11 of the antennæ fuscous, palpi dark ferruginous, elytra blue-black, with five, more or less quadrate, small flavous patches on each. The front patch

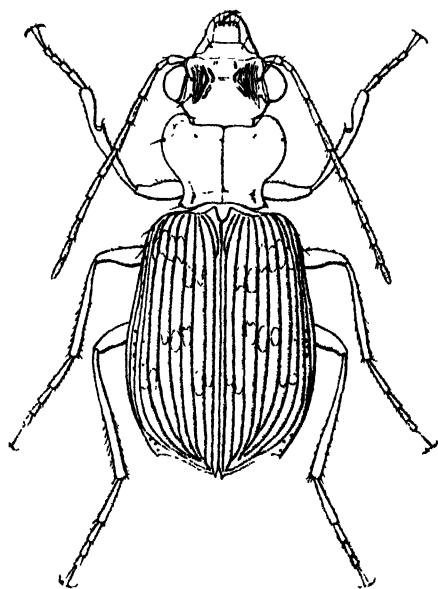


Fig. 28. *Pericalus cordicollis* sp. n.

behind shoulder covers intervals 5 to 8; the next, just behind and nearly joining the front one is on intervals 3 and 4; just behind middle is a transverse patch on intervals 4 to 6; the two remaining patches, midway between the median patch and apex, and nearly on a level with each other, are on intervals 2-3 and 7-8.

*Head* wide, with a moderate neck constriction, frontal foveæ rounded and very shallow, eyes large and hemispherical, clypeus with five or six slight ridges radiating from middle of base, some half dozen carinæ on each side between eyes, diminishing in length from without inwards, neck and vertex smooth, antennæ exceptionally long, quite reaching middle elytra. *Prothorax* cordate, convex, slightly narrower than head, a fourth wider than long, base slightly, apex rather deeply emarginate, front angles projecting but strongly rounded, sides unbordered, moderately explanate and reflexed, strongly rounded in front and sinuate at a fourth from base, front seta at about a third from apex, the widest point, hind one on the angle, hind angles right, very sharp, reflexed, and projecting a little outwards; median line and front transverse impression moderately deep, hind transverse impression and basal foveæ deep, the latter continued forward to apex along the inner margin of the explanate sides, disk with some vague cross-striation and a longitudinal impression on each side in front, margins finely and faintly rugose. *Elytra* convex, ovate, a half wider than prothorax and as much longer than wide, shoulders rather square, sides at first straight for a short distance and then rounded, apex truncate, emarginate on each side, sutural angle sharp and dentate, outer angle very sharp and conspicuously dentate; striæ deep and impunctate, intervals strongly convex, 3 with three pores, one near base, one at middle (right elytron only), and one close to apex. The microsculpture on the elytra is conspicuous, formed by strongly transverse meshes on the intervals and almost isodiametric ones in the striæ; on the prothorax the meshes are much finer, but strongly transverse; on the head they are isodiametric. Underside smooth and impunctate, the middle of prosternum and the pro- and mesofemora more or less pubescent; metepisterna a half longer than wide; apical ventral segment (♀) with two marginal setæ on each side.

Allied to *P. guttatus* Chevr., and very similar in colour, but a little longer and narrower. The head is smooth in the middle and there is an evident neck constriction; prothorax more rounded in front, especially the angles, and much more contracted behind, the surface smoother; elytra narrower and longer, the apical truncature and microsculpture similar, the yellow spots in front quite differently disposed.

Tenompok Pass, 1 ex. ♀.

**Dolichoctis constricticollis** sp. n. [Fig. 29].

Length: 5-5.5 mm. Width: 2.25-2.4 mm.

Black, with the elytra faintly iridescent: joint 1 of antennæ and to some extent joints 2 to 4, palpi, knees, apex of tibiæ, tarsi, margin of and two spots on each elytron more or less ferruginous. The spots are round and rather small, the shoulder spot on intervals 5 to 7, the apical one on 3 to 5.

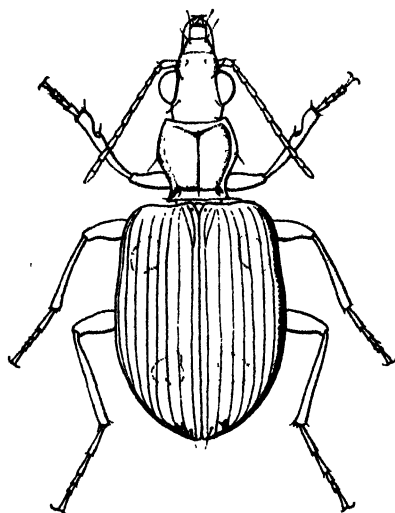


Fig. 29. '*Dolichoctis constricticollis* sp. n.

*Head* convex, dull, a fovea at each end of clypeal suture, eyes moderately prominent, antennæ extending rather beyond base of prothorax. *Prothorax* moderately convex, cordate, a little wider than head and also a little wider than long, sharply contracted behind and subconstricted in front of base, which is slightly narrower than apex, sides strongly but not very widely reflexed, well rounded in front, though with a distinct obtuse angle at the widest point, just before middle, where there are a pore and seta on the border, strongly sinuate a little before base, the hind seta on the angle, hind angles slightly acute, very sharp, reflexed and projecting laterally; median line very fine, front transverse impression shallow, hind one very deep, joining the small, but deep, rounded foveæ, surface rather faintly transversely striate. *Elytra* convex, quadrate, more than twice as wide as prothorax, a fourth longer than wide, sharply rounded rather than truncate at apex; striæ extremely fine, impunctate, deeper at sides, a short scutellary stria present; intervals quite flat on disk, somewhat convex at sides, 3 with a barely visible pore just behind middle and a small knob close to apex, from

just behind which there issues a very long seta. Microsculpture of elytra formed by exceedingly fine and closely placed transverse lines, hardly forming meshes, the prothorax with ill defined transverse meshes, the head with conspicuous isodiametric meshes.

Very much like *D. quadratipennis* Andr., similar in colour, and only a little longer. The chief differences are found in the prothorax, which is more contracted and sub-constricted behind, an angle and seta just before middle at sides, the basal impression very deep, and the hind angles projecting laterally. The elytra are similarly quadrate, but a little shorter, the striæ a little finer, the microsculpture even finer.

Kenokok, 1 ex. A second example, in the F.M.S. Museums, Kuala Lumpur, labelled "Selangor, Kuala Lumpur, Gombak Valley, Oct. 11, 1921 (*H.M. Pendlebury*)" differs only from the type in having rather deeper striæ on the elytra, similar to those of *quadratipennis*.

***Dolichoctis bifasciatus* sp. n.** [Fig. 30].

Length: 3.5 mm. Width: 1.7 mm.

Piceous: palpi, basal joints of antennæ, knees, tarsi, and lateral margins of prothorax and elytra ferruginous, two fasciæ on the elytra flavous. The front fascia is oblique, spreading on each elytron from the shoulder inwards and backwards, covering intervals 4 to 8, but very faint on 5; the hind fascia is a zigzag, extending from stria 8 on one side to stria 8 on the other, the coloured patches on striæ 1, 2, and 6 to 8 about on a level, that on 1 reaching and rounding the apex, while the patches on 3 to 5 are a little in advance of the others, that on 4 a little behind the other two.

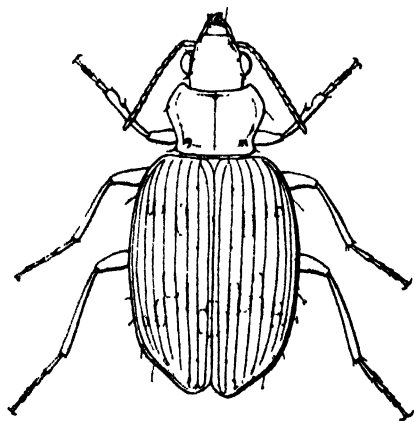


Fig. 30. *Dolichoctis bifasciatus* sp. n.

*Head* moderately convex, frontal foveæ shallow and a little uneven, eyes moderately convex, antennæ extending



rather beyond the base of prothorax. *Prothorax* moderately convex, subcordate, about a third wider than head, a half wider than long, sides of base somewhat oblique, apex emarginate, sides reflexed, nearly straight to the widest point, just in front of middle, where there is almost an angle, thence nearly straight again to the base, with only a suggestion of sinuation, both setæ on the border, front one at widest point, hind one on the angle, hind angles reflexed, a little obtuse and rounded; median line moderately impressed, front transverse impression slight, hind one and basal foveæ fairly deep, latter bounded outwardly by a somewhat raised area, surface a little uneven round the hind angles. *Elytra* convex, oval, two thirds wider than prothorax, not quite a half longer than wide, hardly truncate but with a very distinct re-entrant angle at apex; striæ moderately impressed, impunctate, scutellary striole very short, intervals somewhat convex, 3 with three pores, which are more conspicuous than is usual in the genus, surface little uneven. The microsculpture of the elytra is very distinct, formed by strongly transverse meshes; on the prothorax the meshes are moderately transverse, and on the head they are isodiametric.

Though much smaller, not unlike *D. figurata* Andr., the fasciæ similarly placed, though otherwise formed, the pale lateral margins of the prothorax not so wide.

Marei Parei, 2 ex.

***Parena pendleburyi* sp. n. [Fig. 31].**

Length: 8 mm. Width: 3.4 mm.

Black: palpi, joints 1 to 3 of antennæ, lateral margins of prothorax, femora (except apex), tibiæ, and tarsi more

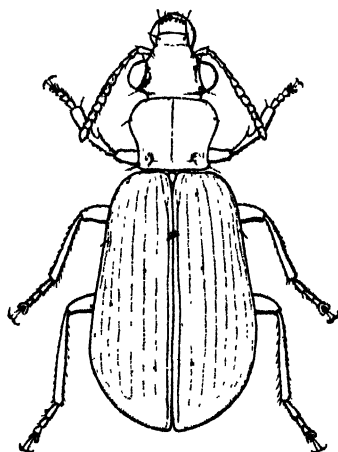


Fig. 31. *Parena pendleburyi* sp. n.

or less ferruginous, elytra metallic green, with some purplish-red on shoulders and at apex, sutural interval dark green.

*Head* rather flat, some longitudinal striæ near eyes, front with two shallow lateral foveæ on each side and a small central one, all rather uneven, neck slightly constricted, eyes very large, hemispherical, antennæ reaching just beyond base of prothorax, surface minutely and sparsely punctate. *Prothorax* convex, subcordate, barely as wide as head, nearly a third wider than long, extremities truncate, sides narrowly bordered, bisetose, reflexed, gently rounded in front and equally gently sinuate before base, hind angles reflexed, right but rounded; median line and hind transverse impression both shallow, front transverse impression more marked, basal foveæ fairly deep, rounded, surface minutely and sparsely punctate. *Elytra* moderately convex, subovate, twice as wide as prothorax, a third longer than wide, widest at a third from apex, shoulders square, apex very sharply rounded; striæ very fine, minutely and very clearly punctate, intervals nearly flat, 3 with three conspicuous pores close to base, just before middle, and near apex, the two first adjoining stria 3, the last adjoining stria 2, surface minutely punctulate, the punctures of varying sizes. There is no evident microsculpture. Underside rather uneven, with a slight sparse pubescence, visible chiefly on venter; metepisterna very long and narrow, last ventral segment with two marginal setæ on each side.

In colour not unlike *rubropicta* Andr., without the central red spot on the elytra, but in form more like *fasciatus* Chaud., compared with which the head is wider, the sides of the prothorax more narrowly reflexed, the elytra similar in shape, even more finely striate, and without any depression on each side of disk.

Lumu Lumu, 1 ex. (probably ♀).

## XXI.—DIPTERA NEMATOCERA FROM THE LOWLANDS OF NORTH BORNEO.

By F. W. EDWARDS

(British Museum, Natural History).

With 5 figures.

The following is a report on the collections of Nematocerous Diptera (other than *Culicidæ*, *Chironomidæ*, *Ceratopogonidæ* and *Cecidomyiidæ*) formed by Messrs. C. Boden Kloss and H. M. Pendlebury during a visit to British North Borneo in July-September, 1927. During this visit no ascents were made above 200 ft. On a subsequent occasion Mr. Pendlebury made the ascent of Mt. Kinabalu and obtained large collections there; these will form the basis of a later report. Thanks to the generosity of the collectors, the types of all new species here described are preserved in the British Museum.

The collection having been made chiefly near the coast, it is not surprising to find that it includes a large proportion of known species, some of which have an extensive range; among these we may note several Philippine species, and one (*Gonomyia punctipennis*, Edw.) previously recorded only from the island of Buru. The *Tipulidæ* as usual far out-number the other families in species; 72 species were represented, of which 20 are described as new; of the remaining 52 only 12 have previously been recorded from Borneo.

The only comprehensive paper on the *Nematocera* of Borneo is one by the writer reporting upon collections made by Dr. E. Mjöberg on the mountains of Sarawak in 1922-3 (Sarawak Mus. Journ., III, 1926, pp. 243-278). In that paper a list was given of the craneflies known from Borneo, but in compiling the list the following were overlooked:—

*Limonia* (*Libnotes*) *impressa*, Walk. Type from Sarawak.

*Gonomyia* (*Lipophleps*) *conjugens*, White. Kuching (Brit. Mus. Coll.)

*Pselliophora* *ophionea*, Edw. Type from Mt. Matang (Bryant).

*Tipula vilis*, Walk. Type from Sarawak.

*Tipula cinereifrons*, de Meij. Gunung Kenepai (recorded by de Meijere, 1911).

It should further be noted that the specimen recorded as *Epiphragma klossi*, Brun., was not that species but *E. insignis* v. d. W.; also that the doubtful record of *Ctenacroscelis novæ-guinææ* de Meij., probably referred to *Ct. punctifrons* Rond. The position of Rondani's species in *Ctenacroscelis* is confirmed by the fresh material now available.

## Family Mycetophilidæ.

## Subfamily Ceroplatinæ.

**Rhynchoplatyura longirostris**, de Meij. Kudat, 1 ♂.

**Platyura (Isoneuromyia) xanthina** sp. n.

♂. *Head* orange, face lighter. Ocelli in a straight line, enclosed in a heart-shaped black spot; middle ocellus smaller than laterals; distance of lateral ocelli from eye-margins about the same as their distance from one another. Palpi yellowish. Antennæ thick and flattened, mainly orange, but last four segments dark brown. *Thorax* orange, without dark markings on integument; mesonotum with dense and uniformly distributed black setulæ. Pleurotergites without any distinct white dusting. *Abdomen* not much widened, normal in shape, orange, except for the eighth segment, which is black; pubescence decumbent, mainly black, but on bases of segments 2-5 it is orange, so that to the naked eye the abdomen appears indistinctly banded. Hypopygium small, claspers short, with the usual two terminal teeth. *Legs* orange; coxæ and femora unmarked; femora with short decumbent orange pubescence; tibiæ appearing blackish owing to dense rows of black setulæ, spurs and tarsi black. *Wings* clear, even at tip, veins all black; *M2*, *Cu1* and *An* as usual not quite reaching margin; *m-cu* fusion about as long as stem of fork. Halteres orange.

Length of body, 5 mm.; wing, 6.5 mm.

Bettotan, 1 ♂.

This is smaller than the other oriental species of the subgenus, and very distinct in colouring, but is a typical *Isoneuromyia*.

**Platyura (Proceroplatus) limpidadex** sp. n.

*Head* blackish above, front below ocelli yellowish, face dark. Antennæ and palpi wholly dark brown; flagellar segments 2-6 in ♂ each at least twice as deep as long, following segments successively less deep, last two much longer than deep and scarcely flattened; in ♀ the whole flagellum is much less flattened than in ♂, the intermediate segments less deep. *Thorax* brownish, shoulders, scutellum and pleuræ pale. *Abdomen* dark brownish, segments 2-4 broadly margined with ochreous posteriorly, 5 less distinctly so. *Legs* with coxæ clear yellow, femora somewhat smoky, especially on underside towards base, tibiæ and tarsi darker, spurs black. *Wings* with conspicuous markings as follows: a brown area in middle extending from *R1* to *Cu1* and covering stem of median fork; an irregular band just beyond this, extending from *R5* to *Cu2*; and a brown area in anal cell; tip of wing broadly clear. All veins (except *An*) dark brown; *R4*, *M1* and *M2* narrowly seamed with

brown. Costa reaching nearly three-quarters of the distance from *R5* to *M1*; *An* very short and indistinct. Halteres with blackish knob.

Length of body, 3 mm.; wing, 3 mm.

Bettotan, 5 ♂ 2 ♀.

Differs from allied species *P. pulchripennis* S.-W. and *P. poeciloptera* Edw. of Ceylon, and *P. graphica* Skuse of Australia, in the clear wing-tip.

In reviewing the subgenera of *Platyura* (Proc. Linn. Soc. N. S. W., LIV, 1929, p. 163). I omitted to notice two features which are common to all species of the subgenus *Proceroplatus*, including the new one here described: (1) the fine tibial setulæ, although in regular rows for the whole length of the dorsal surface, are irregularly arranged beneath on about the basal third of the tibia; (2) the *m-cu* fusion is short, markedly shorter than the stem of the median fork.

#### Subfamily Sciophilinæ.

##### *Mycomyia klossi* sp. n.

♂. *Head* yellow, except for a small black ocellar spot. Palpi and scape yellow, flagellum dark brown. *Thorax* brownish-yellow, only the scutellum and a small spot above each wing-base dark brown. Scutellum with four bristles. *Abdomen* blackish, segments 1-5 broadly yellowish at base. Hypopygium small; ninth tergite consisting of two large rounded lateral hairy pieces and a small median pubescent area, beneath which are two strong, black, blunt-tipped hooks. *Legs* with coxæ and femora yellowish, tibiæ and tarsi darkened. Middle coxæ simple. First front tarsal segment shorter than tibia. *Wings* with the outer two-fifths distinctly darkened, as far back as base of median fork; a dark area in middle from costa to *r-m*, including the small cell. *Sc* ending in *R1* near end of small cell; *R5* slightly curved, ending well before wing-tip but scarcely if at all exceeded by the costa; *M2* as long as stem of fork; *fCu* below base of *r-m*. Halteres with black knob.

Length of body, 2.5 mm.; wing, 2.5 mm.

Bettotan, 1 ♂.

Although the wing-markings are suggestive of the subgenus *Neoempheria* the venation and other characters indicate an affinity with the group of *M. fimbriata* Mg.

*Mycomyia* sp. inc. (cf. *fimbriata* Mg.) Samawang 1 ♀.

*Leia* (*Rhymoleia*) *annulicornis* Brun. Samawang, 1 ♂, 1 ♀.

*Rondaniella* (*Indoleia*) *bisetosa* Edw. Samawang, 1 ♀.

#### Subfamily Manotinæ.

*Allactoneura cincta* de Meij. Bettotan, 1 ♂, 1 ♀.

Subfamily *Mycetophilinæ*.*Exechia mastigura* Edw., var.?

Differs from the type (from Malay Peninsula), as follows:—Body lighter in colour. First abdominal segment with a small blackish spot on each side at base. Hypopygium of ♂ with the intermediate appendages two-thirds as long as the whip-like appendages, composed of a slender bare stem and an elongate club fringed on one side. Halteres with base of knob somewhat darkened.

Bettotan, 1 ♂ 1 ♀.

In this species, the front tibia and first tarsal segment have a close-set, posterior row of short, blunt-tipped bristles; the middle tibiæ have a close-set anterior row of short bristles extending nearly the whole length.

Subfamily *Sciarinæ*.

*Scythropochroa velata* End. Bettotan, 1 ♂.

*Scythropochroa sordidata* Edw. (?). Sandakan, 1 ♂. The venation is almost the same as in the type ♀ (from Malay Peninsula). Claspers nearly globular, with a short, blunt lobe on inner side near base, and a row of three strong spines (two long, one shorter) beyond the lobe.

*Scythropochroa longipennis* Brun. (?). Bettotan, 1 ♀.

Differs in venation from the last (*R*<sub>1</sub> longer and median fork shorter).

*Phorodonta malayana* Edw. Bettotan, 3 ♂.

*Sciara nigrifemur* Edw. Bettotan, 1 ♀.

*Sciara copiosa* Ldf. Bettotan, 2 ♂ 12 ♀; Samawang, 3 ♀; Sandakan, 1 ♀; Kudat, 1 ♀. The hypopygium is almost identical with that of *S. rufithorax* v. d. W., but the species seems distinct by the black colour of the thorax in both sexes.

*Sciara pahangensis* Edw. Bettotan, 1 ♂.

*Sciara solita* Walk. Bettotan, 1 ♂ 14 ♀.

*Sciara orientalis* Brun. Bettotan, 4 ♂ 1 ♀.

In addition to the above, the collection includes examples of half a dozen other species of *Sciara*, at present indeterminable.

Family *Bibionidæ*.

*Plecia subvarians* Walk. Bettotan, 5 ♂ 2 ♀. Some of the males are typical, others have the processes of the ninth sternite much stouter than usual, and perhaps represent a distinct variety or species.

*Plecia borneensis* sp. n. (Fig. 1).

Black, with dull reddish thorax, pleuræ indistinctly darker. Antennal flagellum in ♂ 6-segmented, last two segments subequal and almost fused, in ♀ 9-segmented,

few segments longer, last long and pointed; pubescence half as long, verticils slightly longer than diameter of segments. Rostrum very short, but palpi well developed. *Throax* shining blackish-brown, scutellum and pleuræ lighter. A few short sternopleural hairs present. *Abdomen* blackish, posterior margins of segments narrowly lighter. Hypopygium large and thick; ninth tergite simple, not emarginate, even slightly produced in middle;

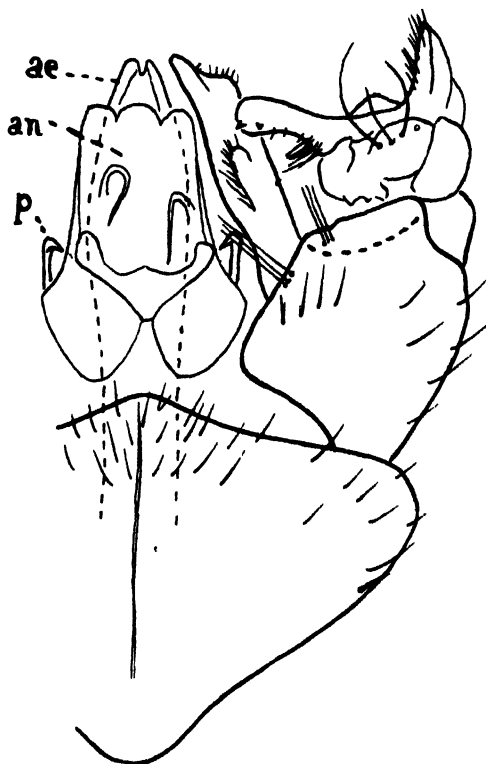


Fig. 3.

anal segment with complex chitination; ventral process of coxite long and somewhat lobed, but not clubbed as in *L. umbrata*, only one style, which is of rather complex form, rostrum without spines. *Legs* with coxæ and bases of femora ochreous, remainder darkened. Claws with basal tooth only. *Wings* uniformly smoky, but not very dark; stigma darker, small and inconspicuous; veins dark, but not dark-margined, *Sc* ending at middle of *Rs*, *Sc2* at its tip; *Rs* long, gently curved; tip of *R1* turned up sharply at *r*; *m-cu* at base of discal cell. Halteres blackish, base of stem pale.

Length of body, 4 mm.; wing, 5 mm.

Bettotan, 1 ♀.

Somewhat resembles and is perhaps related to *L. (D.) umbrata* de Meij., but differs conspicuously in the shining thorax and structure of hypopygium.

***Limonia (Limonia) infantula* sp. n. (Fig. 4).**

♂. *Head* dull dark brownish, antennæ and palpi black. Front of moderate width, as wide as 4-6 facets. Flagellar segments shortly oval, without distinct necks; pubescence almost as long as diameter of segments, verticils scarcely longer than pubescence. Rostrum short, palpi well developed. *Thorax* uniformly dull ochreous. Apparently no sternopleural hairs. *Abdomen* dark brown. Hypopygium very small; ninth tergite slightly emarginate; ventral lobe of coxite short but broad and square-ended;

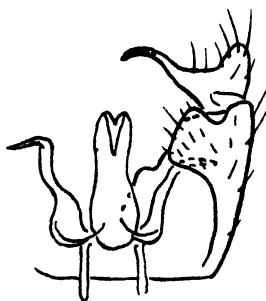


Fig. 4.

only one style present, formed of a small fleshy basal portion and a long, thin, curved, inwardly-directed apical portion, the outer part of which is darkened. *Legs* slender, brownish; claws apparently simple. *Wings* nearly clear, stigma scarcely indicated; shape narrow, anal lobe practically absent. *Sc* reaching middle of *Rs*, *Sc2* near its tip; *Rs* rather long, gently curved; tip of *R1* sharply turned up at *r*; *M3* and *M4* more divergent than usual; *An* not sinuous. Halteres with slender pale stem and dark knob.

Length of body, 2 mm.; wing, 3 mm.

Bettotan, 1 ♂.

I know of no very close relative of this species, which seems well distinguished by its small size and hypopygial structure.

***Limonia (Geranomyia) notata* de Meij. (*cornigera* Alex.)**

Kudat, 1 ♂.

***Limonia (Geranomyia) flavicosta*, Brun. Labuan, 1 ♀.**

***Limonia (Geranomyia) tridens* Brun. Kudat, 1 ♂ 3 ♀.**

***Limonia (Geranomyia) albilabris* sp. n.**

♂. *Head* blackish, including antennæ. Front with a prominent tubercle, which is approximately hemispherical, not horn-like as in *L. (G.) notata*. Rostrum about as long



as head and thorax together, black to a little beyond the two-segmented palpi, then whitish with a very narrow blackish ring close to tip. Flagellar segments nearly globular. *Thorax* entirely dull; mesonotum chestnut-brown, darker at sides, lighter above wing-root; pleuræ dark, without stripes. Middle of pronotum forming a finely pubescent tubercle recalling the prescutal tubercle of *G. notata*, but rather larger. *Abdomen* dark brown, posterior margins of segments pale. Hypopygium with coxite long; dorsal style slender, curved; ventral style small, not half as long as coxite, rostrum long, the two "spines" scarcely distinguishable from ordinary hairs. *Legs* ochreous; femora with a narrow dark brown subterminal ring; tip of tibiæ and tarsal segments narrowly dark. *Wings* with two brown clouds, one over base of *Rs* and including tip of *Sc*, the other at middle of *R*; traces of two more clouds, above arculus and at stigma; cross-veins faintly margined with brown. *Sc* ending at one-third of *Rs*; *Sc2* just beyond base of *Rs*; tip of *R1* faint; *r* long and curved; discal cell somewhat longer than the cells beyond it. Halteres ochreous.

Length of body, 5 mm.; wing, 6.5 mm.

Kudat, 1 ♂.

Apparently related to *L. (G.) notata* de Meij., but very distinct by the absence of stripes on the pleuræ, position of thoracic tubercle, etc. Several unrelated species have a similar colouring of the proboscis.

***Limonia (Pseudoglochina) unicinctipes* Alex.** Samawang jungle, 1 ♀.

In this specimen the hairs of the antennal flagellum are much longer than in *L. (D.) kobusi*, two dorsal hairs on each segment being almost three times as long as the segment bearing them. Wings with a small brown cloud on costal margin at tip.

***Limonia (Libnotes) crocea* Edw., var.**

Bettotan, 3 ♂; Samawang, 1 ♂ 1 ♀.

Differs from the Malayan form in the uniformly orange thorax, the præscutum and scutum lacking the black markings of the type.

***Limonia (Libnotes) impressa* Walk.** Samawang, 1 ♀.

***Limonia (Libnotes) nigricornis* Alex. (?)**. Bettotan, 1 ♀.

***Limonia (Libnotes) simplex* O.-S.** Samawang jungle, 1 ♀.

The abdomen has no dorsal stripe, and the femora are gradually darkened to the black tips, otherwise the specimen agrees with the description of the type from Ternate. Eyes touching.

**Limonia (Libnotes) rufata** sp. n.

♂. Allied to *L. (L.) ferruginata* Edw. (Buru), differing as follows:—Size smaller. Front dark brownish (about two facets wide, as in *L. ferruginata*). First antennal segment black. Tips of femora broadly blackened. Wings with ground-colour dark grey rather than ferruginous; faintly darker clouds at base of *Rs*, tips of *Sc* and *R1*, and on *m-cu*, this last vein well before middle of discal cell. Halteres shorter and almost completely black, only base of stem pale.

Length of body, 9 mm.; wing, 11.5 mm.

Bettotan, 1 ♀.

**Orimarga borneensis** Brun. Bettotan, 7 ♂ 50 ♀; Sandakan, 1 ♂.

**Lechria lucida** de Meij. Bettotan, 2 ♀.

**Helius ferruginosus** Brun. (?). Bettotan, 1 ♂ 1 ♀.

**Helius rufescens** Edw. Bettotan, 1 ♂; Samawang, 1 ♀.

**Helius fumicosta** Edw. Bettotan, 4 ♂ 1 ♀.

**Helius fratellus** Brun. (?). Bettotan, 1 ♀.

**Elephantomyia (Elephantomyodes) argenteocincta** Walk. Bettotan, 9 ♂ 2 ♀.

**Elephantomyia (Elephantomyodes) nigriceps** Edw. Bettotan, 1 ♀.

**Elephantomyia (s. str.) pendleburyi** Edw. (?). Samawang, 1 ♂ (damaged).

**Ceratocheilus latifrons** Brun. (?). Bettotan, 5 ♂ 2 ♀.

**Toxorhina brunniventris** sp. n.

♂. *Head* black, including antennæ and proboscis. Eyes separated above and below head by about width of 6 facets. *Thorax* dark brown above, shoulders broadly ochreous, scutellum light brown; pleuræ ochreous, with a rather broad blackish stripe from neck to base of abdomen. *Præscutum* rather strongly produced; humeral angles dark brown, rather prominent and ear-like as seen from above. *Abdomen* uniformly dark brown, hypopygium somewhat lighter. *Legs* dark, coxæ and bases of femora ochreous. *Wings* clear. Discal cell open. Halteres with blackish knob.

Length of body, 4.8 mm.; wing, 4.8 mm.; proboscis, 6 mm.

Samawang jungle, 1 ♂.

Related to *T. fasciata* Edw., differing in the unicolourous abdomen.

**Toxorhina ochreatea** sp. n.

♂. *Head* ochreous, dusted with grey. Eyes about as in the last species. Antennal scape ochreous, flagellum and proboscis blackish. *Thorax* uniformly ochreous above and on sides, slightly shining. Humeral angles white. *Abdomen* brownish, posterior halves of tergites lighter. *Legs* dark brownish, coxæ and bases of femora lighter. *Wings* clear. Discal cell open; cell *M*3 very short. Halteres brownish.

Length of body, 4.5 mm.; wing, 4.5 mm.; proboscis, 6.5 mm.

Samawang jungle, 1 ♀.

Differs from all other oriental species known to me in the uniformly ochreous thorax. It can hardly be the female of the last species, though taken at the same time and place.

*Styringomyia mcgregori* Alex. Kudat, 1 ♂ 1 ♀.

*Styringomyia ceylonica* Edw. Bettotan, 2 ♂; Samawang, 1 ♀.

*Styringomyia jacobsoni* Edw. Kudat, 1 ♂ 1 ♀.

*Styringomyia biroi* Edw. (?). Kudat, 1 ♀. The specimen agrees fairly well with the description of the type ♀ from New Guinea, but in the absence of the ♂ the determination is not quite certain.

*Styringomyia armata* Edw. Bettotan, 3 ♂ 1 ♀; Samawang, 1 ♂. These agree with typical Philippine specimens.

***Styringomyia curvispina*** sp. n.

♂. *Head* ochreous, bristles black. Antennæ slender, flagellar segments elongate oval; scape dark beneath, lighter above; first flagellar segment ochreous, remainder darker. Palpi black. *Thorax* brownish, with grey pruinescence; pronotum and scutellum yellowish; margins of præscutum as seen from above darker brown. One strong posterior pronotal bristle; two very small humeral; three discal; the four scutal bristles strong, outer pair much longer than inner and somewhat flattened; scutellar bristles slender. *Abdomen* dark brown, unbanded. Hypopygium with coxite short, bearing two strong, black, curved spines set on widely separated tubercles, upper spine somewhat stronger and more bent inwards than lower spine; anal segment long; the long bare style with a short thumb-like projection externally near tip. *Legs* light brownish, the usual rings only faintly darker, scarcely perceptible. *Wings* clear, veins light brownish; a distinct spot over *r-m*, and the usual seams at base of cell *M*1 and over *m-cu*; *R*2 + 3

and tips of most veins (especially *An* and *Ax*) darkened. *R2* + *3* short, very little oblique; *Ax* gently curved down to margin. Halteres with knob darkened.

Length of body, 5 mm.; wing, 3.5 mm.

Bettotan, 1 ♂.

Apparently belongs to the *ensifera*-group, and most resembling *S. transversa* Edw. (Sarawak), but quite distinct by the faintly ringed legs, gently curved vein *Ax*, etc.

**Teucholabis angusticapitis** Brun. (*nocticolor* Edw.)

Bettotan, 8 ♂ 4 ♀.

**Teucholabis bicolor** O.-S. Bettotan, 2 ♂.

**Gymnastes ornatipennis** de Meij. Bettotan, 2 ♂.

**Gymnastes multicinctus** sp. n.

♂. *Head* dark brown above, front yellow. *Antennæ* with the first segment blackish, second mainly yellowish flagellar segments pale at base. Mouth-parts black. *Thorax* dull dark brown above pronotum, shoulders and scutellum light yellow. *Pleuræ* light brownish, a narrow yellow stripe at notopleural suture. *Abdomen* brownish. *Legs* conspicuously variegated with black and white. Front femora blackish, with indications of a narrow pale ring beyond middle; tibiæ with two white rings, one at base and a somewhat broader one beyond middle; tarsi with basal half of first segment and almost the whole of the second segment white. Middle femora with a narrow pale ring beyond middle; tibiæ with a broad white ring in middle and a very narrow one at base; tarsi with first two segments white with black tips, remainder black. Hind femora white above on distal third; tibia with basal two-thirds white; tarsi with first segment white except tip, remainder black. *Wings* nearly clear; dark brown seams over base of *Rs* and cross-veins, and at tips of all veins. Rows of small subcircular scales on costa, *Sc*, *R*, and *R1*. *R2* short, transverse, far beyond end of *R1*. Halteres with dark brown stem and lighter knob.

Length of body, 3 mm.; wing, 4.5 mm.

Bettotan, 1 ♂.

I place this species in *Gymnastes* on account of the scaly legs, although the venation is almost that of *Paratropeza*. It is remarkably distinct from other species of the genus in leg-markings and in the presence of scales on certain veins. The wing bears a superficial resemblance to that of the African *Gonomyia venustipes* Alex.

**Erioptera notata** de Meij. Bettotan, 1 ♂ 3 ♀; Sandakan, 2 ♀.

**Erioptera derasa** sp. n. (Fig. 5).

Almost uniformly light brownish-ochreous, only the front silvery and the antennæ and knob of halteres dark brownish; legs uniformly pale. Flagellar segments in

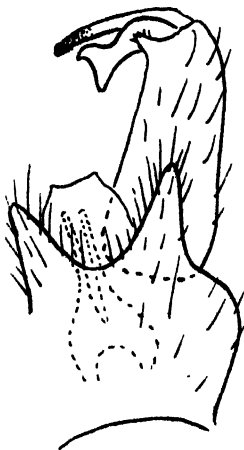


Fig. 5.

both sexes elongate oval. Eyes well separated. Hypopygium small; ninth tergite deeply bilobed; upper style somewhat expanded and bilobed apically, lower style with blunt, blackened tip. Hair on veins very short and inconspicuous. *Rs* long; lower fork not longer than its stem, its base distal to that of the upper fork; *Ax* short and straight, ending at or scarcely beyond level of base of *Rs*.

Length of body, about 4 mm.; wing 5 mm.

Samawang, 5 ♂ 2 ♀.

In spite of the short vein *Ax* I refer this to *Erioptera* s. str. because it seems evidently related to *E. abrasa* Edw., *E. orientalis* Brun. and *E. ferruginea* Brun.

**Erioptera geniculata** sp. n.

♀. Head dark brownish, eye margins and lower part of front with whitish pruinescence. Palpi and antennæ blackish, flagellar segments elongate oval. Thorax dull brownish-ochreous, pleuræ with whitish pruinescence. Abdomen dark brown. Legs brownish, femora with a dark subapical ring, the tips conspicuously white; bases and tips of tibiae also narrowly white. Wings with a distinct grey cloud over base of *Rs*, and a broad grey seam over cord. Hair on veins of moderate length. Venation normal; *Rs* long; *m-cu* before fork; *Ax* sinuous. Halteres brownish.

Length of body, 3 mm.; wing, 4 mm.

Bettotan, 2 ♀.

Differs from the allied *E. javanensis* de Meij. (Java) and *E. rogersi* Alex. (Formosa), which also have white-tipped femora, in the clouded wings. A third specimen

from the same locality has the head lighter in colour; knees yellowish instead of white; posterior margins of abdominal segments pale; and clouds on wings more distinct.

**Gonomyia (Ptilostena) punctipennis** Edw. Samawang, 1 ♀.

**Gonomyia (Lipophleps) incompleta** Brun. Bettotan, 98 ♀, at light.

**Gonomyia (Lipophleps) diffusa** de Meij. Bettotan, 19 ♀; Samawang, 1 ♀.

**Gonomyia (Lipophleps) robinsoni** Edw. Bettotan, 4 ♀.

**Gonomyia (Lipophleps) citrocotalis** sp. n.

♀. *Head* dark above, yellow round eyes and on front. *Scape* yellow above, dark below; *flagellum* blackish except at base, segments slender, with short verticils. *Palpi* and *proboscis* black. *Thorax* dark brown above, scarcely shining; pronotum and a narrow margin of mesonotum yellow; scutellum brownish. *Pleuræ* mainly dark brown on upper half, notopleural membrane yellow; a broad whitish stripe on lower half, bordered above and below with black. *Abdomen* dark brownish, posterior lateral corners of tergites and posterior margins of sternites yellowish. *Legs* with front coxæ whitish, middle and hind coxæ blackish at base, remainder ochreous; remainder of legs brownish, femora with the tips very narrowly ochreous, preceded by a faintly darker ring. *Wings* with the costa and first vein conspicuously pale yellow throughout, remaining veins dark; membrane in basal cells and at tip largely dark grey; stigma blackish. *Sc* ending far before base of *Rs*; *R2* absent. *Halteres* with knob largely dark, yellow at tip.

Length of body, 3.5 mm.; wing, 4 mm.

Bettotan, 1 ♀. Also Kiau, Mt. Kinabalu, 3,000 ft., 1. v. 1929, 2 ♀, at light (including type).

Allied to *G. (L.) fijiensis* Alex., differing in the dark stigma.

**Trentepohlia (Mongoma) pennipes** O. S. Bettotan, 3 ♂ 2 ♀;

Samawang, 2 ♂ 1 ♀. One of the females is remarkable in having lost vein *R2*, as in the subgenus *Plesiomongoma*; it is however certainly only an aberration of *T. pennipes*.

**Trentepohlia (Mongoma) tenera** O.-S. Samawang, 2 ♂.

**Trentepohlia (Mongoma) pallidiventrtris** Brun. (?).

Samawang, 1 ♂.

**Trentepohlia (Mongoma) cariniceps** End. Bettotan, 1 ♂ 1 ♀.

**Trentepohlia (Mongoma) quadrimaculata** sp. n.

♀. *Head* dark brown above, a small area above antennæ yellow; eyes narrowly separated. *Scape* whitish-yellow, *flagellum* black, without long hairs. *Mouth-parts*

black. *Thorax* uniformly shining, mostly blackish-brown, but pronotum, anterior third of præscutum, middle of scutum and an irregular stripe across lower half of pleuræ ochreous. *Abdomen* blackish, segments broadly banded with ochreous basally. Cerci rather long but strongly curved. *Legs* with coxæ blackish; trochanters ochreous; femora blackish with tips rather narrowly white; tibiæ black, narrowly white at base and rather more broadly at tip; tarsi whitish, slightly darkened apically. No distinct femoral spines. *Wings* with ground-colour clear, veins all dark; four conspicuous black marks on membrane, one in base of lower basal cell, one over base of *Rs*, one over *r* and the fourth over *R2*; cord, apex of discal cell and tip of *Ar* also bordered with black. *R2* far beyond *r*, nearly vertical and rather sinuous; base of cell *M3* at middle of discal cell; cell *Cu* just closed. Halteres black, base of stem ochreous.

Length of body, 11 mm.; wing, 9 mm.

Samawang, 1 ♀.

A very distinct species allied to *T. splendida* Brun., but with quite different wings.

***Trentepohlia* (Mongoma) *lutescens* sp. n.**

*Head* ochreous with central carina; scape ochreous, flagellum and mouth parts dark brown. Flagellar segments elongate, subcylindrical, each with one long dorsal hair about twice as long as the segment (in both sexes). *Thorax* uniformly ochreous, not or scarcely shiny. *Abdomen* ochreous, first tergite mainly dark, tergites 2-6 dark in middle and apically, the dark areas forming a more or less interrupted dorsal stripe. *Legs* rather stout, uniformly ochreous, tips of femora not darkened. All femora (in both sexes) with 10-15 short black spines at base beneath, those on middle femur in two irregular rows. *Wings* clear, costal cell yellowish; stigma distinct, brown; veins of cord black, remainder brownish. *R2* long, well beyond *r*, which is oblique; cell *Cu* just closed or narrowly open; base of cell *M3* slightly proximal to that of cell *M1*. Halteres with ochreous stem and brownish knob.

Length of body, 1-12 mm.; wing, 9.5 mm.

Samawang, 5 ♂ 5 ♀.

Allied to *T. cariniceps* End., differing in the distinct stigma, long flagellar hairs, etc.

***Trentepohlia* (Mongoma) *setifera* sp. n.**

*Head* blackish, with central keel. First antennal segment and rostrum light brownish, remainder of antennæ and palpi dark brown; flagellar segments short-haired, elongate oval. *Thorax* dull brown above, pleuræ and middle of scutum lighter. *Abdomen* blackish above, venter light ochreous. *Legs* with coxæ ochreous; femora and tibiæ

brownish; front tibiæ rather narrowly and indistinctly whitish at tip, mid and hind tibiæ more distinctly and rather more broadly white; tarsi whitish. All femora ( $\delta$  &  $\varphi$ ) with 6-10 very short and inconspicuous dark spines at base beneath; hind tibia in  $\delta$  only with 4-6 rather long black bristly hairs dorsally in the white apex; first hind tarsal segment of  $\delta$  with dark hair on one side at base. *Wings* clear, veins all dark. *R2* curved, approximating to horizontal, not far beyond and nearly twice as long as *r*; base of cell *M3* much proximal to that of cell *M1*. Cell *Cu* just closed. Halteres dark brown.

Length of body, 5 mm.; wing, 5.5 mm.

Bettotan, 2  $\delta$  1  $\varphi$ ; Samawang, 1  $\delta$ .

Distinguished from *T. pallidiventris* Brun. and allied species by the more distinctly white-tipped tibiæ and the tibial bristles of the  $\delta$ .

***Trentepohlia* (Mongoma) labuana sp. n.**

*Head* black, antennæ and mouth-parts dark brown. Flagellar segments elongate-oval, short-haired. *Thorax* slightly shining, dark brown above, pleuræ lighter. *Abdomen* dark brown above, lighter beneath. *Legs* slender, coxæ ochreous; femora brownish, narrowly whitish at tips; all tibiæ broadly white at tips; tarsi white. Front femora with 2-4 longish slender spines at some distance from base, other femora unarmed; first hind tarsal segment with dark hair on inner side at base. *Wings* clear except for the small stigma; all veins dark. On hind margin of wings close to base (immediately beyond squama) are two stout curved bristles, stouter in  $\delta$  than in  $\varphi$ . *R2* scarcely beyond and scarcely longer than *r*, straight and oblique; base of cell *M3* proximal to that of cell *M1*; *Cu* ending in *An* just before its tip. Halteres brownish.

Length of body, 5.5 mm.; wing, 5.5 mm.

Labuan, 2  $\delta$ ; Bettotan, 1  $\varphi$ .

Differs from *T. pacifica* Alex. (Samoa) in the shorter stem to cell *R2* and other details. The strong bristles at the base of the wing are a feature not hitherto noticed in any species of the genus; similar but rather weaker, bristly hairs however occur in *T. pacifica* Alex., *T. samoensis* Alex., *T. albangusta* Edw. and probably many other species.

***Trentepohlia* (Plesiomongoma) nigropennata Edw.**

Bettotan, 2  $\delta$  1  $\varphi$ .

***Trentepohlia* (Plesiomongoma) candidipes Edw., var.**

Bettotan, 1  $\varphi$ ; Samawang, 1  $\varphi$ . The tibiæ are not wholly whitish as in the type  $\delta$  (from the Malay Peninsula), but are slightly darkened beyond the white base, then gradually shading to white at the tip.



**Trentepohlia (Anchimongoma) niveipes** Edw., var.

Bettotan, 6 ♂ 3 ♀. The dark tibial rings are narrower than in the Javan type.

**Trentepohlia (Trentepohlia) venustipennis** Edw.

Bettotan, 1 ♂ 3 ♀.

**Trentepohlia (Trentepohlia) trentepohli** Wied.

Bettotan, 6 ♂ 1 ♀.

**Trentepohlia (Trentepohlia) nigrogeniculata** Edw.

Bettotan, 6 ♂ 1 ♀.

**Conosia irrorata** Wied. Bettotan, 3 ♂ 13 ♀.**Clydonodozus curvinervis** sp. n.

♀. *Head* black, heavily dusted with pale grey, as is the scape; antennæ and mouth-parts black. *Thorax* uniformly dull brown above, pleuræ with integument darker but heavily dusted with grey. *Abdomen* dark brown, posterior margins of segments ochreous. *Legs* ochreous, tips of femora and tibiæ and the whole of the last four tarsal segments black. *Wings* with light brown ground colour, base paler; a dark brown transverse band immediately beyond arculus; a dark cloud at base of *Rs*; all veins of cord broadly dark-margined; tips of *R2*, *M3*, *M4*, *Cu*, *An* and *Ax* clouded; an additional dark cloud on *Ax* beyond middle. *R3* strongly curved down at tip; *R4* + 5 also somewhat curved down; basal deflection of *R4* + 5 strongly curved. Halteres blackish.

Length of body, 6.5 mm.; wing, 6 mm.

Bettotan, 1 ♀.

Apparently most nearly allied to *C. griseiceps* de Meij. (Simalur I.), differing in venation and wing-markings.

**Epiphragma signata** de Meij. Bettotan, 1 ♀.**Epiphragma bakeri** Alex. (? var. *ochrinota* Alex.).

Bettotan, 1 ♂ 1 ♀.

**Eriocera ruficauda** sp. n.

♀. *Head* blackish. Frontal tubercle distinctly divided as seen in side view. Antennæ and palpi blackish, second scapal segment lighter; antennæ about as long as head and thorax together. *Thorax* uniformly dull reddish-brown, no darker markings on mesonotum; hair longish and dark. *Abdomen* orange-red, only tergites 5 and 6 black (even base of 5 orange). *Legs* with coxæ coloured like thorax, remainder black. *Wings* blackish, including base; a broad yellowish fascia a little beyond middle extends from *R1* to hind margin. *Sc* reaching to level of *r*, which

is twice its own length from base of *R2*; cell *M1* present, as long as its stem; *m-cu'* at middle of discal cell. Halteres black.

Length of body, 18 mm.; wing, 17 mm.

Bettotan, 1 ♂.

Allied to *E. mesopyrrha* Wied. (Java) and *E. pyrrhomesa* Edw. (Sumatra), differing from the former in the black legs and antennæ and from the latter in the uniformly brown thorax and more extensively orange abdomen.

***Eriocera unimaculata* sp. n.**

*Head* dull black. Front with two tubercles, anterior one small. Antennæ and palpi black; antennæ in both sexes only about half as long as head and thorax together. *Thorax* uniformly dull black. *Abdomen* dull black, segments 2-7 each with broad shining leaden grey basal bands. Basal portion of ovipositor black, appendages reddish. *Legs* slender, black. *Wings* black, with a pure white crescent in middle reaching from *R1* to *Cu*. *Sc* ending above end of *R2* + 3; *r* about its own length from base of *R2* and scarcely twice its length from tip of *R1*; *R2* scarcely twice as long as *R2* + 3; cell *M1* absent; *m-cu* near middle of discal cell. Halteres black.

Length of body, 8-15 mm.; wing, 7-12 mm. (♀ larger).

Bettotan, 6 ♂ 6 ♀.

Allied to *E. hilpa* Walk. (Hong Kong), differing in the much shorter cell *R2*, smaller white mark on wing, and black instead of orange ovipositor.

**Subfamily Tipulinæ.**

***Nesopeza caloptera* sp. n.**

♀. *Head* brownish, paler round eyes, space below antennæ pale ochreous; rostrum and palpi black. Antennæ about as long as thorax; scape dark brown, first flagellar segment ochreous, remainder dark. *Thorax* dull brownish, without distinct markings. *Abdomen* brown, segments with ochreous markings in middle and at sides. *Legs* with coxæ and trochanters ochreous; femora brownish with black tips and an ill-defined paler pre-apical ring; tibiæ pale brownish, shading to white on the apical half, tip narrowly black; tarsi white. *Wings* with a conspicuous pattern; four main dark areas towards costa, narrowly bordered with darker brown, and then more broadly with whitish; ground-colour of wing pale grey; tips of most veins darkened, the largest spot on tip of *An*, that at tip of *Ax* very small; an additional spot on hind margin between *An*

and *Ax*; *m-cu* with a narrow dark border. *Rs* with long spur; cell *R3* much narrowed near tip; cell *M1* very short. Halteres dark brown, only base of stem pale.

Length of body, 6 mm.; wing, 6 mm.

Bettotan, 1 ♀.

Allied to *N. perpulchra* Edw., but much smaller, with different wing-markings, venation and colouring of legs.

***Dolichopeza sandakanensis* sp. n.**

♂. Closely allied to *D. cuneata* Edw. (mountains of Sarawak), differing chiefly in hypopygial structure, as follows:—Ninth tergite less produced, with only a small median emargination which includes a minute median tooth; pleurite produced into blunt, blackened process; sternite membranous in middle, produced apically into a pair of finger-like, hairy processes. Coxæ pale as in *D. cuneata*, but hind tarsi almost completely white, as in the Malayan *D. angusta*, Edw.

Length of body, 8 mm.; wing, 10 mm.

Samawang jungle, near Sandakan, 1 ♂.

The Philippine species of this group (*Nesopeza cinctitarsis* Alex., *N. annulitarsis* Alex. and *N. angustaxillaris* Alex.) are strikingly similar to the Bornean species in colouring and venation, but are all distinct in hypopygial structure.

***Scamboneura quadrata* de Meij.** Samawang, 1 ♂ 2 ♀;  
Kudat, 7 ♀.

***Megistocera fuscana* Wied.** Bettotan, 1 ♂; Kudat, 1 ♀.

***Nephrotoma javensis* Dol.** Kudat, 2 ♂.

***Ctenacroscelis punctifrons* Rond.** Bettotan, 2 ♂ 5 ♀.

***Tipula xanthomelæna* Edw.** Bettotan, 1 ♀.

***Tipula* (*Tipulodina*) *cinctipes* de Meij.** Bettotan, 1 ♀.

## XXII.—PAPERS ON MALAYAN AQUATIC BIOLOGY.\*

### XII. BYRRHIDÆ, HYDROPHILIDÆ, CHRYSOMELIDÆ.

By S. Maulik.

Family Byrrhidæ.

Subfamily Thaumastodinæ.

Champion, Ent. Mo. Mag., 1924, p. 25.

*Pseudeucinetus zygops*, Heller.

*Pseudeucinetus zygops*, Heller, Ent. Blätter, 17, 1921, Heft 10-12, pp. 155-156.

*Thaumastodus fusiformis*, Champion, l.c., p. 27.

The history of this species is as follows: In 1919 C. F. Baker sent to the British Museum and to K. M. Heller of Dresden examples of this species from the Philippines. In 1921 (l.c.) Dr. Heller published a description placing this species under the family *Melandryidæ*, while in 1924 (l.c.) Mr. Champion dealt with the British Museum specimens erecting a new subfamily which he thought was allied to *Limnichinæ*—a subfamily of *Byrrhidæ*. Mr. Champion's view was strengthened by the fact that his son collected in great numbers similar beetles, but belonging to a new genus, on the river banks at Kumon in Northern India.

Dr. Heller was certainly wrong in considering them as belonging to *Melandryidæ* which is a family of the *Heteromera*, while the species under consideration has all the tarsi four-segmented. The figure given in Heller's paper is incorrect, in that the shape of the head is not as it is in nature, neither are the segments of the tarsi of the middle legs correctly represented. The figures given in Champion's paper are detailed, correct and well drawn.

Although Champion's name falls as a synonym of Heller's the name of the subfamily erected by him (Champion) stands.

In studying this species I have made a microscopic preparation, and I have seen Heller's cotype and Champion's type and other examples. Here I wish to record my thanks to Mr. K. G. Blair of British Museum.

The present record extends the geographical distribution of this species, and affords us definite information about its habits. Although these beetles are not properly aquatic there is no doubt they live near fresh water and probably feed on water plants.

7 examples.

Kuala Lumpur: Setapak Pond D, 11th & 12th August, 1926, among algae (C. Dover).

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\* Continued from Vol. XIV, parts 3 and 4, July 1929.

**Family Hydrophilidæ.**

**Hydraena** sp. 2 examples.

Selangor: In one example the record is as follows:

"Morib, W. Coast," in dirty ditch. In the other example: Setapak Pond D, among algæ, 12th August, 1926 (C. Dover).

**Family Dytiscidæ.**

1 example.

Kuala Lumpur: Setapak Pond H. 24th August, 1926 (C. Dover).

**Family Chrysomelidæ.****Subfamily Galerucinæ**

**Luperodes bimaculatus** Hornst. var. **scutellatus** Jacoby.

1 example. Selangor. In dirty pond near Ulu Klang. 1st September, 1926 (C. Dover).

**Subfamily Eumolpinæ.**

**Pagria** sp. 1 example.

Kuala Lumpur: Setapak Pond C, 10th August, 1926 (C. Dover). The presence of these two chrysomelid beetles in water is accidental.





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New genera, species, &c., are shewn in Clarendon type.

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